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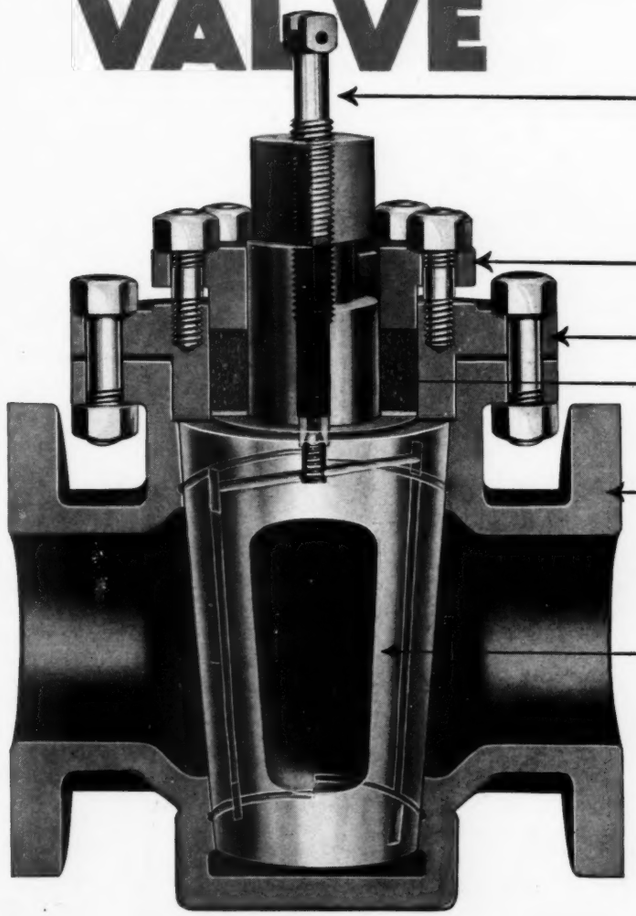

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New East Texas Order Soon Protested

Highest production in 1930, week ending Feb. 22, average daily output 2,699,096 bbls. Peak of U. S. production, week ending Aug. 24, 1929, average 2,975,435 bbls.

One Major Company Declares It Will Resist It. Situation in Big Field Worse. More Demand for Special Session

By James McIntyre

Lowest daily average crude oil production in the United States during 1930 was for week ending Dec. 27 with average output of 2,144,074 bbls.

Week after week the situation in East Texas grows worse.

In the past week the Texas Railroad Commission issued an order limiting the production of the field to 250,000 bbls. during the month of July, and immediately the protests began.

One major company notified Governor Sterling that it will resist the order, and the governor has openly stated that the order cannot be enforced and that the only solution to the problem is a special session of the legislature at which a law can be enacted that will give a commission all the authority necessary to enforce its rulings on the conservation of Texas' natural resources.

The average price of crude oil in the East Texas Field in the month of June was 15 cents per barrel. At that price it will take 200,000 bbls. of oil to pay for drilling and equipping an oil well in that field, the cost of which, all things included, is $30,000. Including the royalty owner's one-eighth share in the calculation, the well owner must sell around 225,000 bbls. of oil before he can break even on his $30,000 investment on the well alone. In adddition he has to provide enough oil to pay for the first cost of the lease.

In the face of this and other unfavorable conditions, including the ever-present salt water threat, the attitude of East Texas oil producers, who are not oil buyers, is beyond the understanding of any man outside the feverish territory in which this mad scramble for crude volume rather than profits is going on. Reports from East Texas say that royalty owners, disappointed at the small return they are receiving, are becoming the most enthusiastic adherents to proration and that they are backing Governor Sterling in his desire to have a law enacted that will restore order in that biggest of all fields. They were sadly misguided and they realize it.

The action of the Oklahoma Corporation Commission in increasing the allowable output of Oklahoma City Field for the months of July, August and September was brought about by an increased demand for the oil from that field. The increased production of Oklahoma was mostly responsible for the net increase in the production of the United States in the past week.

PRODUCTION IN THE UNITED STATES

Estimated daily average production of crude oil in the United States for week ended July 4 and a comparison with the previous week follows:

	July 4	June 27
Oklahoma—		
Oklahoma City	214,445	155,460
Seminole-St. Louis	136,560	146,870
Remainder of State	239,955	241,420
Total Oklahoma	590,960	543,750
East Texas—		
Kilgore	144,648	163,110
Lathrop	94,950	82,205
Joiner	112,374	114,389
Total East Texas	351,972	359,704
West Texas	206 772	213,696
North Central Texas	87,665	86 771
Texas Panhandle	66,792	60,064
East Central Texas	60,643	59,800
North Louisiana	35,955	35,690
Arkansas	43,915	44,220
Kansas	102,890	101,840
Total Mid-Continent area	1,547,564	1,505,535
Gulf Coast	157,071	156 664
Southwest Texas	64,079	65,265
Eastern	108,000	110,500
Rocky Mountain area	98,961	97,257
California—		
Santa Fe Springs	62,000	63,000
Long Beach	75,500	76,000
Playa Del Rey	24,500	25,000
Elwood	26,000	25,500
Kettleman Hills	67,000	62,500
Remainder of State	252,750	258,250
Total California	507,750	510,250
Total United States	2,483,425	2,445,471

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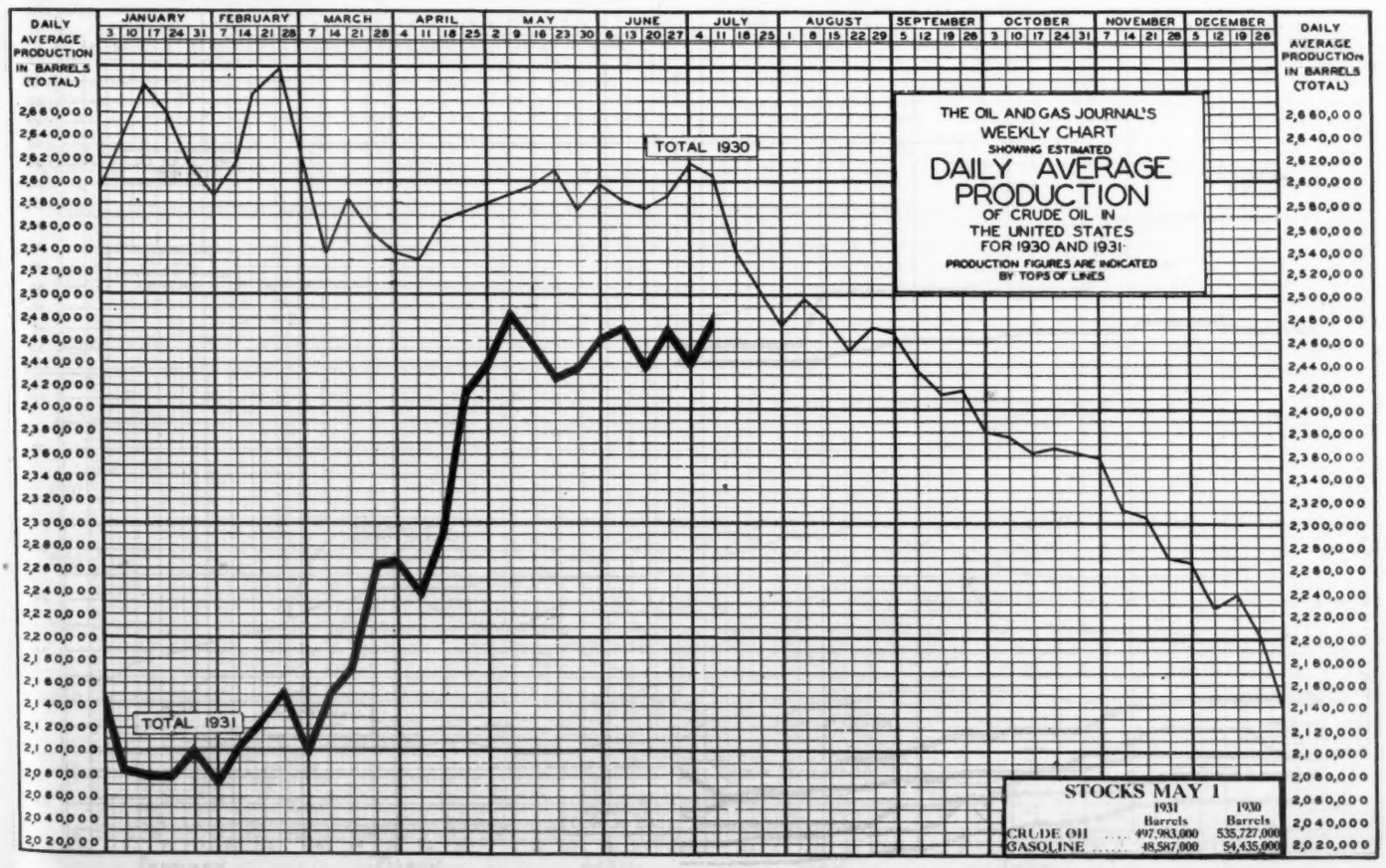


Refiners Maintain Gasoline Advance

Buying Slow-up at Oklahoma Refineries Following Holiday Rush. Large Decrease in Natural Gasoline Output During Year

By C. O. Willson

Tank car sellers of gasoline in Oklahoma (Group 3) on Monday and Tuesday were maintaining the advances of the previous week. As expected the demand was not so strong following the heaviest buying period of the year in preparation for the holiday period which ended Monday.

Reports from representative companies with service stations in the Middle West and Southwest indicated that the actual consumption of gasoline over the week-end was as large as expected. Due to this condition sellers were of the opinion that bulk stations of jobbers and refiners would require additional supplies immediately and they are anticipating more tank car buying before the end of the week.

The U. S. Motor gasoline which dropped to a low of 2 cents two weeks ago in spot shipments advanced steadily all of last week and on Monday and Tuesday, 2¾ to 3 cents was the going market to the trade out of Oklahoma. Some refiners are still behind in their shipments and in most cases not only in Oklahoma but in other Mid-Continent areas, sellers have orders which will take care of their output until July 15 at least.

On the bearish side, some buyers are predicting that the heavy buying for July is over in the gasoline market. They are predicting a lull which will cause several refiners to lower their quotations in a few days. It will probably require several days to determine which viewpoint of the future market is correct. On the buying side, it is probable that some of the refiners who have been purchasing from other refiners will find it necessary to purchase additional gasoline before the end of the month and with a normal demand from jobbers, most market students are not expecting any slump in shipments during July.

REFINED MARKET BAROMETER

Gasoline tank car prices for the most part were steady throughout the entire country the first part of the week. Buying was not so active at many refining centers following the holiday period but sellers were not inclined to lower their quotations. The principal weakness centered in the eastern states where general reductions in tank wagon and service station prices reflect the failure of the tank car market to advance despite a heavy consumption. Inquiries and actual movement of export gasoline for the week were exceptionally heavy. Kerosene unchanged. The seasonal dullness in furnace oils continues and the heavier gas oils and fuel oils are still not generally active. No general changes in lubricants. Irregular demand for wax.

Mid-Continent—Gasoline prices firm following advances of previous week. Natural gasolines fractionally higher. Kerosene weak. Slow demand for fuels, gas oil and distillate. Fair movement of lubricating oils. No change in wax prices.

East Coast—Gasoline market unsettled with general reductions in tank wagon and service station prices. Slow kerosene movement. Gas oil demand spotty. Irregularity in wax market. Fair movement for Diesel oil at firm prices. No change in fuels.

Chicago—Gasoline stronger. Better movement for lubricating oils. Little trading in fuel oil and gas oil.

Gulf Coast—Trading generally dull. No important price changes.

Pennsylvania—Fair movement of practically all products except kerosene which is slow. Price ranges unchanged.

California—Feeling of uncertainty regarding ability of refiners to maintain recent advances in gasoline quotations. Other products unchanged.

East Texas Situation

The latest development in the East Texas situation was the promulgation of a new proration order by the Texas Railroad Commission. The terms of this order are explained elsewhere in this issue. If this order can be enforced which appears doubtful at this time, the limitation of production should aid in bringing about a better feeling in the refined market during July and August.

Should the latest order prove unenforceable, it is believed that the calling of an extra session of the state legislature to pass a law which can be enforced, will be the next step. In the meanwhile new refinery construction is announced weekly for the East Texas area. At present, seven new plants are skimming approximately 35,000 bbls. of crude oil daily in East Texas. Plants under construction and assured for the field could easily double these crude runs to stills by early fall. In this connection, The Oil and Gas Journal's monthly check on Mid-Continent crude runs to stills published in this issue shows that this month the Mid-Continent area will be refining 588,840 bbls. of crude oil daily, a new all time record. However, due to the fact that refiners as a unit curtailed their operations during the winter and spring months and entered the summer with a strong stock situation, these increased runs to stills at this time should not disturb the market as much as they would under different conditions.

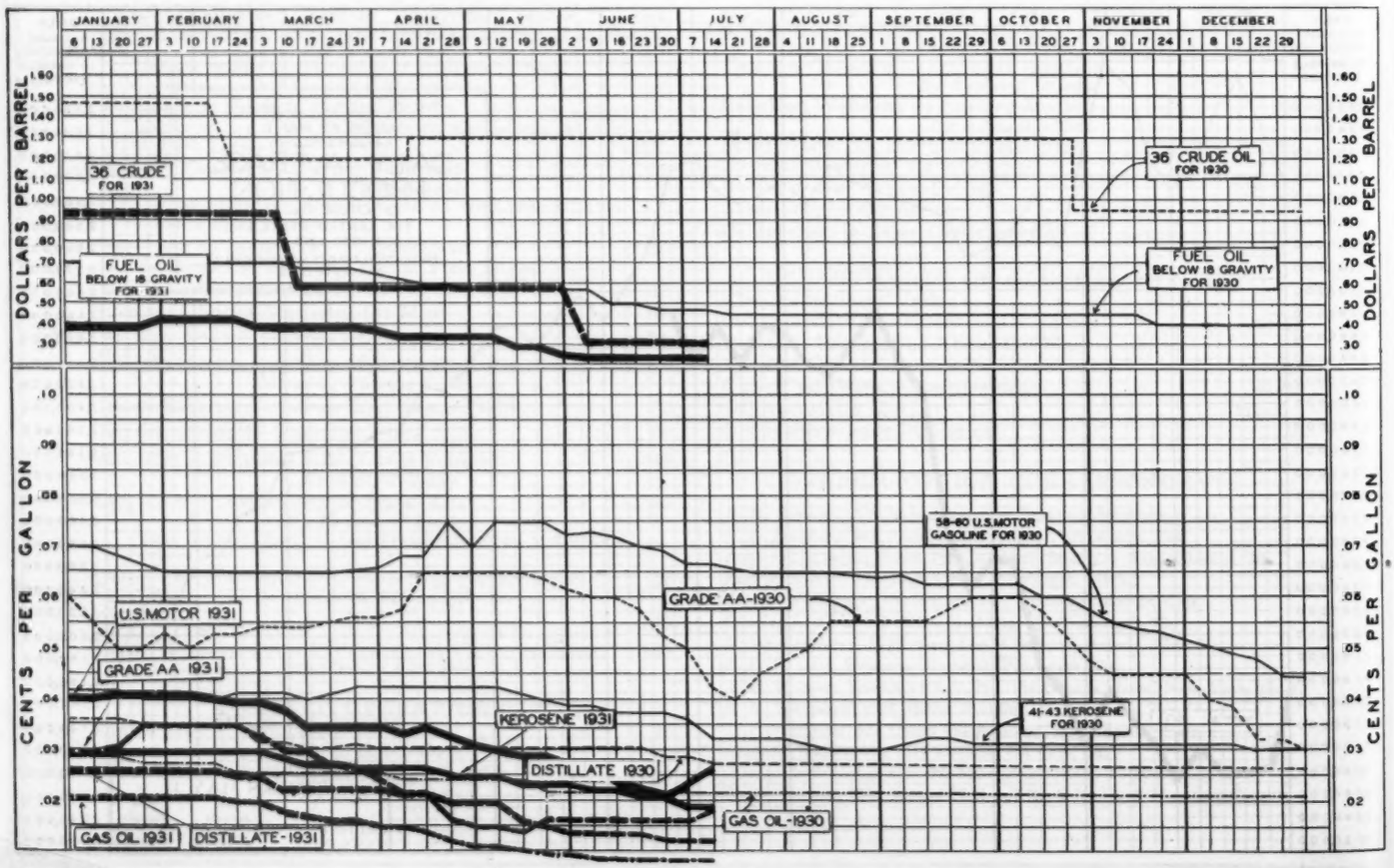
Natural Gasoline

Last week the storage and current production situation in regard to refinery gasoline was explained in these columns the conclusion being that so far as plant operations were concerned the refinery market was in a much stronger statistical situation than it was a year ago.

During the past week, the Bureau of Mines report for May covering natural gasoline plant operations became available and this shows a similar condition in regard to that product. Natural gasoline production in May of this year averaged 5,170,000 gallons daily for the entire United States which compares with 6,130,000 gallons daily in May of last year, a decrease of almost 1,000,000 gallons daily or 15 per cent.

The Mid-Continent decline in produc-

(Continued on Page 117)



Speculating on East Texas Production

Now Believed That Production per Well in the Immense Area Will Be Relatively Small. Interesting Projected Figures

By Nell Williams

HOUSTON, Tex., July 6.—Although one of the largest fields the world has known, East Texas seems destined to be a field of relatively small daily average production per well. This might not seem true when the field is spoken of solely through the perspective of the great flush flow of oil which it has dumped on the market almost overnight, or when the almost uniform large rated potential capacity of individual wells is looked upon, but the unprecedented development of the area with its rapidly increasing number of new wells is bringing about a situation not generally recognized.

The situation in a few words is that while total production of the district has been restricted to a large extent, either through proration efforts, market requirements, outlet facilities or through efficiency methods on the part of some operators, drilling and bringing in of additional wells in rapid order has gone on unabated. The result is that the proportional increase in total completed wells in the area is far greater than the gain in the amount of production which can be, or is being, moved out.

Thus, the trend in average production figures per well is, and has been for some time, sharply downward, despite the flush newness of the field and its potential producitveness. If this relatively low average production per well is ratably distributed, the field, of course, is the better for it although it means that profit taking for individual wells may be a long drawn out proposition.

Interesting Figures

Some interesting figures have been compiled indicating the relationship of completed wells to total daily production in East Texas and what may be expected during the next few months. For the week ended February 18, the daily average production of East Texas fields was 25,601 bbls. and at that time there were 23 producing wells. This represented an average of 1,113 bbls. per well. The field was discovered in the preceding September, but it was not until February that development got under way in earnest so for the purpose of the graph February is taken as the starting point.

From that time on there has been a steady increase in the number of completed wells, the rate of increase also becoming greater as more and more drilling activity got under way. The first several months until the latter part of April was a period of generally more open flow, during which daily production climbed from 25,601 bbls. to 339,950 bbls. without interruption, and during which the daily average production per well was maintained above 1,000 bbls. The highest daily average per well was reached during the week ended March 11 when the average was a fraction above 1,634 bbls. per well.

Due to putting into partial effect a proration order by the State Railroad Commission, production in East Texas declined sharply the first two weeks in May. The order, originally issued April 4 limiting production to 90,000 bbls., was delayed until May 1, when a revised order increasing the allowance to 160,000 bbls. was placed in effect. While production was not brought within the allowance by a wide margin it was reduced from the first peak of 339,950 bbls. to 257,925 bbls. for the week ended May 13. Since the latter date production has experienced additional increases but the highest figure reached was for the week ended June 18 when there was a daily average of 371,362 bbls., or only 31,412 bbls. above the first peak.

Average Production Per Well

Although the total increase in daily production during May and June has been small compared to the sharp advances made during the period before the last week in May when the first peak was reached, there has been no let up in the rate of completions. On the other hand since early in May the trend of the completion curve has been more sharply upward with from 90 to 100 wells being added weekly. Under this condition, the average production per well has been sharply downward since then.

During the first week in May, the average production per well was cut from 1,012 bbls. on April 29 to 695 bbls. on May 6. With the exception of a slight increase for the week ended May 20, that average has been declining steadily since then until for the week ended June 25 (latest figures available at this writing), the average production was only 370 bbls. per well. For that week the total daily average production was 359,704 bbls. while the total number of wells completed up to and through that week totaled 973.

These figures have not taken into consideration the fact that some of the 973 wells completed are now producing and that the average for the wells actually on production will be larger than the figures given above. However, considering the total number of wells completed, those which have quit flowing are comparatively few in number and most of those are being put on the pump. Consequently the average per well will not be affected a great deal.

Also, it is not to be assumed that the average per well is representative of the potential productions throughout the field. A large number of those wells are capable of, and many are, producing a far greater volume of oil than the average, but wells which are being restrained for one reason or another, together with those which have quit flowing or which are able to make only a small volume of oil bring the average down. At the present rate of decline in the daily average production per well with a continuation of approximately the same rate of completions it will not be long, however, until the average proudction per well will be so low that wells which stop flowing and are put on the pump will be able to produce as much or more than the daily average for the field.

Future of the Field

Although the future of the field cannot be predicted accurately, it is reasonable to assume that there will be additional substantial declines in the daily average per well, even during the present flush development. It is certain that a great many more producing wells will be added to the field. The rate of completions is doubtful but if the rate continues the same as it was throughout May and June 1,375 wells will have been completed by August 1; 1,715 wells, September 1; 2,045 wells, October 1; 2,390 wells, November 1; 2,730 wells, December 1; and 3,070 wells January 1.

These figures are not improbable. Many authorities have estimated there will be a minimum of 5,000 wells by the first of the year. Within the present proved limits of the district there is plenty of space for that many, and, many more. That every test drilled within the present proved limits will make a well also is fairly certain, due to the uniformity of the area and judging on past performance. The drilling of that number of wells, however, will depend entirely on economic and market conditions and financial ability of the operators to carry on.

For the next few weeks, or up to August 1 or perhaps a little longer, it is fairly safe to state that the rate of completions will continue on approximately the same. This is borne out by the accompanying graph, which shows that late in June there were 535 operations in East Texas, including active drilling tests, rigs, derricks and locations. A total of 328 of these were actually drilling and 207 were rigs and derricks, and it is more than likely that at least 90 per cent of the total will be completed as producers. Thus, of the 535 operations, approximately 480 probably will be completed as wells. These, added to the 973 wells reported on June 25, will make a total of 1,453 producing wells which will have been completed in the area, without the making of another location. The completion of these additional wells would be carried over until approximately August 10 although at the speed with which East Texas wells are drilled that period of time can be shortened materially.

Under these conditions it is not likely there will be any important turn in the course of the completion curve until after

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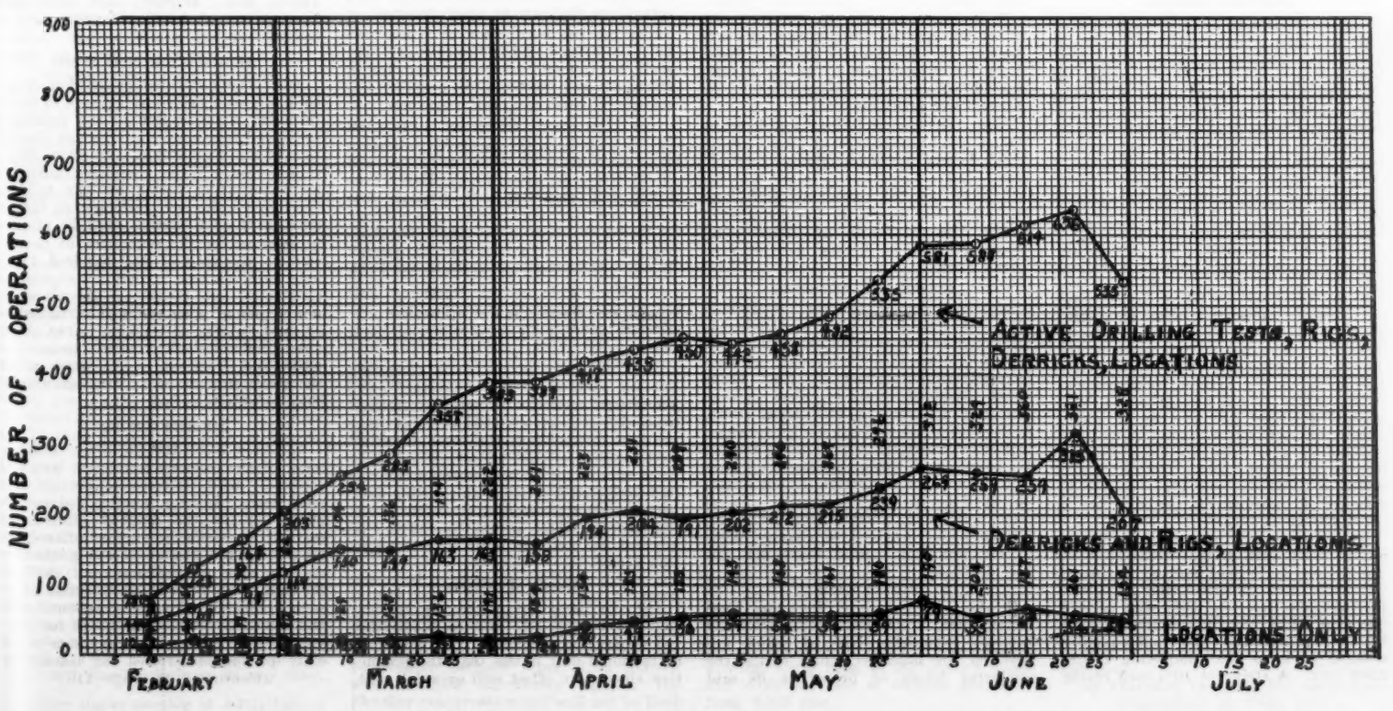

New Oil Field Is Found in California

Barnsdall Test in Gato Ridge District of Santa Barbara County Flows 1,098 Bbls. Novel Filler for Cavity

By L. P. Stockman

LOS ANGELES, Calif., July 6.—The Barnsdall Oil Co. discovered another new oil field in California when its No. 1 Tognazzini in the Gato Ridge district of Santa Barbara County was brought in flowing 1,098 bbls. of 16.2 gravity oil per day from 2,501 feet. The discovery well, located on Gato Ridge, a prominent topographic high in the Los Alamos district of Santa Barbara County, did not look so hot on the preliminary production test made June 26, 1931, as it pumped only 185 bbls. of 15.5 gravity oil cutting 10 per cent. After the 1,400 feet of 2½-inch tubing had been pulled and replaced with 4-inch tubing, however, the well began to flow and a day or two later built up to 1,100 bbls.

This well, located on a 371-acre lease in Section 9-8-32, was drilled in conjunction with the Rio Grande Oil Co. on a working agreement entered into by these operators just previous to the initiation of work at Elwood some three years ago. This agreement, covering past and present development work in Santa Barbara County, became operative when R. A. Broomfield, now executive vice president of Barnsdall, signed a contract to drill a test well on some wildcat acreage which the Rio Grande Oil Co. had leased in Santa Barbara County. The Rio Grande had been unsuccessful in interesting a number of other California companies in this area until after the Barnsdall had finished the discovery well at Elwood. Then it moved into Santa Barbara County en masse and drilled a flock of dry holes.

The geological work on Gato Ridge was done by R. W. (Dick) Sherman, who, previous to becoming chief geologist of Barnsdall, was chief geologist of the Central Oil Co., operated by Colonel F. E. Foster and G. J. Maggenheimer. The Barnsdall and Rio Grande have a total spread in this area of 1,617 acres checkerboarded with a like amount held by the Golconda Petroleum, which concern acquired the original leases. The Texas Company and Continental have holdings northwest of the discovery well, while the Western Gulf has a lease on the Price Ranch due south.

Previous Wildcats

Several wildcats have been drilled in this immediate area, although none of them ever showed anything resembling substantial production, due possibly to the fact that much of the sand may have been mudded off as this drilling was done before perfection of the core barrel. The Shaw Ranch Oil Co.'s first test, located about 3,500 feet west of the discovery, was abandoned at 3,265 feet in 1918 after pumping at the rate of 50 bbls. per day for about two months. The second test on this lease, approximately 2,000 feet south of the first, was likewise unsuccessful up to the time of abandonment at 3,241 feet. The Standard Oil Co. also tried out the Shaw Ranch property but abandoned its project as a duster at 4,960 feet. This well is exactly 1,700 feet west and a little north of the Barnsdall's discovery. The Union drilled two wells on the extreme southern end of this anticline but neither No. 1 Tognazzini at 3,984 feet nor No. 2, abandoned at 2,410 feet, was productive. The Associated also tried its luck without success as did the Dome Oil Co. which drilled a 2,900-foot well that pumped 40 bbls. of 12 gravity oil per day for a short period in 1913.

The Barnsdall's discovery well required more than a year from spud to completion as it was started on April 25, 1930, and finished June 25, 1931. During this time the hole was carried down to 6,510 feet in compliance with lease requirements and subsequently plugged back to the completion depth, 2,501 feet. A string of 10¾-inch casing was landed at 1,750 feet and the hole finished with a 6⅝-inch liner carrying 792 feet of perforated. Considerable difficulty was experienced in the drilling and at one time completion looked hopeless. Nearly three months were required to complete a fishing job when the electric power line went dead and permitted the drill pipe to become frozen at 6,000 feet. This subsequently resulted in a twist off when work was resumed and the crew was fishing from December 26, 1930, until March 13, 1931.

New Use for Fertilizer

Just previously, the bit ran into a cavity that for a time seemed to have no bottom. Between 800 feet and 2,000 feet the hole lost circulation so often that the matter of keeping drilling mud in it becomes a real problem. Approximately 10,000 sacks of cement, several tons of cottonseed hull, sawdust and chemical preparations were used to reinforce the drilling mud which kept disappearing into the fractured shale formation. Finally in desperation, the superintendent sent out a call for stable manure and hauled in all that could be obtained from stables in that section of Santa Barbara County. This material solved the trouble and permitted a resumption of drilling. It is really remarkable that the Barnsdall got such a good well, considering the amount of mud, cement and foreign matter used during the course of work.

The Barnsdall's discovery well is located on a well defined anticline and is producing from the Pliocene-Miocene contact. The trend of the Gato Ridge anticline is from northwest to southeast, although sharp deflections are visible at each nose as it plunges beneath the floor of the valley. It is quite possible that production is coming from the fractured shale as the well is producing from almost 800 feet of formation. The Barnsdall shut in No. 1 Tognazzinni a few days ago and it will be held back as a reserve. Leases in this area are in large blocks and since they are held by reputable operators only a limited amount of drilling is expected.

New East Texas Proration Order

Full Text of Decision Issued by the Oil and Gas Division of the State Railroad Commission at Austin

By Special Correspondent

AUSTIN, Tex., July 3.—The Texas Railroad Commission yesterday issued a special order relating to the East Texas Field, limiting the production of the field to 250,000 bbls. per day and providing for ratable taking of the oil which is to be produced on a unit basis. The order is headed: "In the matter of conservation and prevention of waste of crude petroleum and natural gas, etc., and the prevention of discrimination by common purchasers in the purchase of oil."

The text of the order is given in full below:

Whereas, the general and special orders heretofore issued relating to the East Texas fields, or districts, and bearing date of April 29, 1931, have expired, and,

Whereas, a hearing was had at Austin, Tex., on June 29 and 30, 1931, pursuant to notice to all parties at interest and to the public generally, as required by law, and,

Whereas, it appears that great waste of oil and gas is taking place, and will continue to take place in the East Texas Field, as defined herein, unless production of oil and gas in said field be restricted and regulated:

Now, therefore, it is hereby ordered by the Railroad Commission of Texas (designated herein as "commission") as follows:

1. The present producing areas and any extension thereof in the counties of Gregg, Upshur, Smith and Rusk shall constitute and be known as the East Texas Field.

250,000-Bbl. Allowable

2. Beginning at 7 a. m., on July 2, 1931, and ending at 7 a. m., October 1, 1931, unless sooner modified or changed, not more than 250,000 bbls. of oil shall be produced daily from the East Texas Field, provided, however, that production from new wells, as authorized herein, by Section 4 (d) and any additions which may arise under the provisions of Section 14, hereof, shall not be counted as a part of the allowable production set out above, but shall be in addition thereto. In no event shall the 250,000 bbls. daily allowable above provided, be changed prior to the proration period beginning August 1, 1931.

20-Acre Units

3. (a) The umpire for the East Texas Field, after consultation with the advisory committee, both of which are provided for hereafter, shall divide the producing leases or properties in said field into twenty (20) acre tracts and fractional parts thereof, hereinafter called units and fractional units, and shall divide those portions of leases or properties in new productive areas into units and fractional units as the field may be extended, which division into units and fractional units, shall be subject to change by the commission. Fractional units shall only be created in case there be insufficient acreage in the lease or property of which the fractional unit is a part to create a full unit. Not more than one fractional unit shall be created from any one lease, except where any of the tracts covered by such lease are not contiguous, in which case each noncontiguous tract shall be treated as a separate tract for the purpose of forming units and fractional units. The length of a fractional unit shall not be more than twice its width, if it is possible to form units and fractional units of such form from the lease or tract involved.

(b) A fractional unit of more than ten (10) acres and less than twenty (20) shall be treated as a full unit and a fractional unit of ten (10) acres or less shall be treated as a half (½) unit.

(c) Units and fractional units shall be calculated on the basis of ownership as of date April 29, 1931, being the date of the last order affecting the East Texas Field and providing for division into units and fractional units. No division of tracts or leases after April 29, 1931, shall be allowed to increase the number of units and fractional units in the field.

4. Each unit and/or fractional unit shall participate in the allowable production for the field in the following manner:

(a) The sum of the units (counting one for each unit) and fractional units (counting one-half for each fractional unit with area of ten [10] acres or less) shall be divided into the total allowable to determine for each proration period, as fixed herein, the allowable production for each unit and fractional unit during such period, unless a different allowable is authorized by reason of the application of any rule set forth in some other subdivision hereof.

Matter of Offsets

(b) In the event, under the application of the rule set forth in subdivision (a) above, the production from a well on a fractional unit is less than the production allowed an offset well on a full unit, then the offset well on the full unit shall be reduced to the allowable fixed for its offset on the half unit. However, the owner of the lease covering the full unit shall have the privilege to take from well or wells drilled within the body of the full unit the amount necessary to equal his allowable for the full unit. It is the intention of this provision, as nearly as possible, to equalize the production from offset wells, and if under the application of the general terms of this order, offset wells would not be permitted to produce equally, then such shall constitute a special case and be disposed of, if possible, under the provisions of Section 14 hereof.

(c) The owner of any single lease or tract, shall have the right to produce from a single tract under common fee ownership, by well or wells drilled thereon, the full quantity of oil to which his number of units and fractional units may entitle him. However, not more than two units and fractional units may be allocated to any one well.

Allowable for New Wells

(d) The allowable production in accordance with the above rules is to be determined with respect to the producing units and fractional units having production at the beginning of any given proration period. Wells completed during a given proration period on any unit or fractional unit, not producing at the beginning of such period, shall be allowed to produce for the remainder of the period at the rate of one hundred (100) bbls. each per day, if they are capable of producing that quantity. The allowable production of such wells so permitted to produce shall be in addition to the allowable production distributed among the units and fractional units upon which there was production at the beginning of such proration period.

Ratable Takings

5. As a basis for the better enforcement of the common purchaser law, and especially with reference to Section 8 of such law, requiring ratable takings in proportion to the amount offered for market, the daily production offered for market by the owners of the production on any unit or fractional unit shall be the sum of the allowable production of all such producing units and fractional units and the daily production offered for market from the field shall be the sum of the daily production offered for market by

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Testing Rates of Solution of Oil and Gas

Two Factors Needed to Be Considered in Repressuring Process. Progress in A.P.I. Research on Project

By William N. Lacey
California Institute of Technology, Pasadena, Calif.*

I probably may be kicking over the traces this evening in not preparing a set paper of any sort. It seems to me the sort of thing you might be more interested in would be an impromptu running report of what we have been doing on American Petroleum Institute projects at the California Institute of Technology at Pasadena.

This work started several years ago. I had the pleasure of being present at an interesting meeting at Ponca City, Okla., just about the time we were starting this work, and there was a good deal of discussion on methods of production at that time. I was very much impressed with the facts which were known and the facts which were not known with regard to the process of repressuring. I came away from that meeting very firmly convinced that probably the subject on which there was the least information available was with regard to one particular phase of the repressuring process. We had some information as to the effects of dissolved gas on the properties of the oil which was suggestive and interesting.

Effect of Dissolved Gas on Oil Properties

It seemed to me that, in the repressuring process, there are two factors we need to consider. The first is the maximum quantity of gas which can be put into a formation, related to the total solubility under given conditions; and, second, there is the time in which you can hope to get a given quantity in solution. I do not believe that there is any record available concerning the rate of solution of gas in oil.

We know, at least approximately, what the result may be in respect to changes in properties, but to get those effects we have to wait until the gas is dissolved; so I was convinced—and some of the American Petroleum Institute men agreed—that the work which was most needed then was some determinations of the rates of solution.

Later, it was requested that our Project 37 include, as well, work on solubility and the viscosity effects of dissolved gas. Project 35 (later changed to Project 36) was to determine the effect on surface tension. We have been working on these phases to a certain extent.

Repressuring Work Started

I want to make it clear that the point of view with which we started this work was that of repressuring. In our work on rate of solution and our work on solubility, we worked from the angle of the dissolving of a given gas in a given oil material. That is a somewhat different direction from any that has been used before in solubility work. The attack, in the past, has been by causing the separation of a previously prepared solution.

Now, from the direct producer's point of view, I think that is possibly the angle to go at it. From the point of view of repressuring, however, it seems to us the other method of actually dissolving the gas in the oil is probably the better procedure. I have become more convinced of this as the work has gone on, in that I think we have a process which is capable of such reproducibility as to be somewhat superior to the other methods for that reason alone.

I wanted to point out, first of all, that there are two different methods of attack, and that we worked from the repressuring side. I have outlined the general topics upon which we have worked, and I want to go into the individual research problems more in detail.

I hope this will be very informal. Anyone who has a question, if I do not make myself clear, or a criticism he wishes to make will please speak up at any time. I would very greatly appreciate comments. One reason I was anxious to come and talk was to get new viewpoints on this work we are doing; so, if you have an interruption, please do not hesitate. Also, there is a good bit of talking that can be done; and if anyone gets tired and wants to leave, you wont bother me if you do.

*Before Dallas meeting of A.P.I. June 2.

Work on Rate of Solution

I want to speak first of the rate of solution work, which is the part of our Project 37 that we have carried more nearly to a satisfactory conclusion than the others. This has been under way since we started this project; several different men have worked on it. I want to make clear that this report covers the work of other men. It is sometimes the case that someone who does not do the work talks about it and the other people do not get full credit.

Four men have worked on this rate problem: N. F. Scudder and Frederick P. Stapp did much of the preliminary work. Mr. Scudder worked out a mathematical solution for the diffusion process, and Mr. Stapp carried out a large part of the preparation of samples, as well as making rate determinations. Earl S. Hill has made the more recent rate determinations. Richard D. Pomeroy has worked on the problem longest, and has contributed more than any other of the four men.

Now, the problem we set out to work on was that of determining the rate at which a given gas sample would dissolve in a body of petroleum oil. To have a simple situation for study, we can take a vertical cylindrical container which carries in it a certain body of liquid petroleum. We can close this up except for a gas inlet tube. Beginning with a pressure which is equal to atmospheric, we will suddenly raise the pressure of gas above this body of oil to a given higher value. The first thing that would happen would be solution of gas in the surface of liquid, and probably in a very short time the immediate surface would become saturated with gas at the pressure maintained above it. But the gas molecules going farther into the liquid would have to move from the surface by a process of diffusion due to molecular motion, traveling gradually down into the liquid. We felt sure that the original step of saturation of the surface film, requiring only a few molecules compared to those in the gas space above, would be a very rapid one, and that the time of solution would depend almost completely on the rate of this later process of diffusion.

We started out with a system very similar to this, consisting of a body of oil of known cross section and a gas space above it which we could hold at a certain pressure. The quantities of gas which went into solution in this body of oil were measured over a period of time which would correspond to a fair percentage saturation of the whole body. The apparatus and method for doing this will be illustrated more in detail as we go along, but this describes the fundamental idea with which we started.

Amount of Gas That Enters System

Our first problem was to determine the gas which went into the system. This was measured by using a reservoir system, which was filled to a pressure two to three times the pressure which was to be maintained in the absorption system. It contained a pressure gauge which we used as an indication of the quantity of gas contained in the reservoir system. For example, if we take an ordinary pressure gauge and consider that as a reservoir system filling it to 700 or 800 pounds pressure, we have in this system a certain quantity of gas. This quantity cannot be calculated easily, but by merely using the gauge as an indicator and then calibrating the system we avoid these complications.

The system has been calibrated, not once but a number of times, by filling it up to a pressure of about 800 pounds and drawing off successive portions of gas into a mercury pipette at atmospheric pressure. In this way a calibration curve of quantity of gas withdrawn versus decrease in gauge-reading is obtained. A more useful curve, derived from it, is that showing total quantity of gas in the reservoir versus gauge-reading. We found the system to be a very reproducible one over long periods. By taking calibrations at intervals, any small trends in the system could be studied systematically and taken into account. After filling the gas reservoir and placing the correct quantity of oil in the absorption cell at atmospheric pressure, the system was made tight and gas was admitted from the reservoir to the cell to bring it to a definite pressure. The pressure was measured by means of a test gauge which was calibrated against a dead weight tester and checked at frequent intervals.

Now, what we did was to admit gas from the reservoir into the absorption cell. Of course, the minute you let gas in, there is going to be some solution; and it takes a short period of time to reach the desired pressure, readjust the temperature, and measure the quantity of gas which has been admitted. By this time all the gas you put in there was not there in the gas phase, because some of it had dissolved. That seemed to be, at first, a difficult problem; but when we found the nature of the curve we obtained, it ironed out. In other words, we can express the absorption rate on the basis of a straight line function; and by getting the points for the first half hour—or even for the first two or three hours—we can follow back on a straight line to an initial volume, which would correspond to the volume which we would have admitted initially if the process had been accomplished instantaneously.

We have checked this method back by direct timing with as great accuracy as we could get. The whole apparatus was thermostated at carefully controlled temperature, being most of the time within one-tenth of a degree, which seems sufficiently close. This initial volume admitted is subtracted from the total volume admitted to obtain the volume of gas dissolved.

The temperature at which we have worked is 30° C. or 86° F. That particular temperature was chosen, not because of any particular charm of that figure, but it was the lowest temperature which we could hope to maintain the year round in the laboratory we have been using, without going to an expensive cooling system for our thermostat.

Methane Gas Used

The most hopeful way to get at the problem was to use as simple a system as we could get and, therefore, we worked with a gas which was as near to pure methane as conveniently possible. This gas was obtained by taking a natural gas and passing it through an active charcoal cell to adsorb the higher hydrocarbons from the mixture, thus producing a gas in the neighborhood of 98 per cent or a little bit better in methane. Our idea in simplifying the system was that we might duplicate results, and that we might be able to draw conclusions as a result of them. To simplify the liquid phase, we prepared a number of hydrocarbons of varying properties, which, although none of them were pure, at least were relatively limited in their boiling ranges. We have also worked with crudes, but I will discuss them later.

We thought at first we would try a very soluble gas in order to get a very rapid result and tried carbon dioxide. Carbon dioxide is much more soluble than methane. We got some results which were very different from what we expected. We found the answer was that solutions of carbon dioxide in the oil were more dense than the original oil. As a result, there was set up a perfect density circulation system which gave rapid solution. On the other hand, we know the densities of solutions of methane and other hydrocarbon gases in the petroleum are lower than the density of the oil without the gases. The lighter materials remain on top, and the heavier on the bottom. We found from experience that no difficulty results in the case from mechanical circulation.

By analyzing the situation mathemati-

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CALIFORNIANS HOLDING CONFERENCE TO FURTHER STABILIZATION PLAN

By L. P. Stockman

LOS ANGELES, Calif., July 6.—A final effort to effect stabilization in the California oil industry got under way in Los Angeles today and if the series of conferences now being held are successfully concluded the Pacific Coast price structure will show a definite strengthening within the next 10 days.

Major refiners in adopting the Standard's increased prices for crude and refined oil on June 19 indicated they desired adoption of uniform prices. Independent refiners have ratified the proposal and if the independent group can agree among themselves this will be the most constructive step undertaken in the existing crisis.

The significance which attaches to this concerted attempt to stabilize prices lies in the fact that it may lead to more permanent stabilization through regulation of crude oil production. Refiners have been tactfully informed that the referendum petition reported to contain over 100,000 signatures against the Sharkey conservation bill will not be filed if refiners stabilize prices and thus remove the economic necessity of filing it.

Distress gasoline which backed up on independent refiners during the recent gasoline war has played havoc with the refined oil market during the past week with the result that retail prices showed a wide spread between actual quotations and the projected stabilized prices which are predicated on a basis tank wagon price of 13 cents per gallon in Los Angeles territory and normal differentials in other areas depending on the distance from refining centers.

Two new wells were finished in the Kettleman Hills Field over the past weekend and four more are scheduled for completion within the next two or three weeks. The Shell celebrated the Fourth of July by completing No. 1 Dixon flowing 6,500 bbls. per day from 8,807 feet. The Kettleman North Dome Association's No. 23, in Section 1-22-17, was finished flowing 6,400 bbls. of 35 gravity crude and 4,000,000 feet of natural gas daily from 8,338 feet.

July Refinery Operations at New Peak

Mid-Continent Crude Runs Highest in History. Present Schedule 110,000 Bbls. More Than on First of the Year

By W. T. Ziegenhain

Crude runs in Mid-Continent refineries will establish a new high during July. Approximately 110,000 bbls. have been added to the schedule since the first of the year and present runs are 140,000 bbls. more than in March.

Starting the year with an average of 478,795 bbls. daily, operations were gradually curtailed until a low point was reached in March. Then, with marked rapidity, runs were increased until now the total stands higher than at any time.

A large portion of this increase is accounted for in the East Texas refining area. Cheap crude has been the incentive in the development of the East Texas refining operations and additional plants are to be built there, according to new announcements. During July the new refineries in this area will run about 30,000 bbls. of crude daily and this accounts for the greater share of the 40,000-bbl. increase in the runs of the refineries included in the North Texas group.

East Texas Prices

Low crude prices in the East Texas area have naturally stimulated refining in that area. Quotations as low as 8 cents a barrel have been made on this crude even though its quality is comparable with Seminole, Okla., crude.

East Texas refiners are apparently taking the attitude that because crude is cheap they will boost their runs to the limit of gasoline demands, taking less than 2½ cents for their production, and hoping to gain in quantity output rather than hazard sales by attempting to bolster up prices. After the present seasonal demand has subsided and plants are completed which are now under construction in the East Texas area including the Bell Oil & Gas Co. 10,000-bbl. plant at Longview, the Sinclair Oil & Gas Co. 2,000-bbl. plant at Gladewater and the Central Refining Co. 7,500-bbl. plant at Henderson, refiners predict even stronger competition in their efforts to gain the Chicago and Gulf Coast trade normally going to the Oklahoma, Kansas and North Texas refiners.

A factor which is being generally considered as tending to stabilize the future market is the program being adopted by several companies of buying up large volumes of East Texas crude at these sacrifice prices and storing it. As much as 30,000,000 bbls. of this crude might find its way into new storage if producers continue to offer their oil so freely at the present level of prices. This volume together with miscellaneous stocks might be enough to give permanent relief to the crude market even though legislation should fail to curb production. Then if East Texas is taken care of, it is the general belief among refiners that refined oil prices may be advanced.

Second to the North Texas group of refineries, from the standpoint of increased operations since the first of the year, is Oklahoma. This group represents the largest total capacity and the increased operations shows up as relatively large for this reason rather than because any great increase has been made in the schedules of the individual plants.

In July Oklahoma will run 210,500 bbls. daily which represents 28 per cent of the total scheduled for the Mid-Continent. This is about 29,000 bbls. above that run during the first month of this year.

Kansas stands close to Oklahoma in the volume of increased runs so far this year, even though this state includes less than half of the capacity credited to the Oklahoma plants. Kansas has established a total schedule of runs during July of 102,700 bbls. or 24,000 bbls. more than during January.

Arkansas, North Louisiana and West Texas each also shows an increase in operations since the first of the year. This increase is relatively small in each area amounting to only 4,000 to 6,000 bbls.

Compared to June

Compared to the total runs shown for June, the July schedule is 21,000 bbls. higher, the largest increase being shown in the Kansas refining area. Oklahoma showed the second largest increase, amounting to 7,300 bbls. North Louisiana also showed an appreciable increase in operations, the daily increase being 5,100 bbls. Except for the West Texas group all other areas showed an increase also.

July runs might even reach a higher actual figure than the schedules established early in the month indicate. At a number of refining points, where the supply of crude comes from the local fields, operations have had to be held down to a level permitted by that supply. Proration has limited production below current demands in a few instances and these refiners are seeking more distant supplies. Except in the East Texas Field where the practice of posting prices has been suspended by most buyers, there is little crude being offered below the posted price. In a few instances small premiums are reported being paid for additional supplies.

The favorable demand for gasoline which has developed over the past two weeks is largely responsible for the improvement in operations in all areas. This condition is considered seasonal, but has relieved the tenseness which has characterized the market for months. In some instances gasoline orders have been delayed to a point where orders were transferred, a condition which had not been obtained for nearly two years.

Oklahoma Operations

Oklahoma refiners have maintained an even schedule of runs thus far this year and there has been very little change in the status of the operating and shutdown plants except those in the Oklahoma City area. A shortage of crude is reported in a few cases principally in the Garber area, and at Bristow.

North Texas

One new plant was added to the list of North Texas refineries to operate during July. This is the Slack Petroleum Co.'s 1,500-bbl. plant at Camp Switch in the East Texas area. Initial runs will approximate 600 bbls. daily and this schedule will be raised as conditions warrant.

This plant will include a topping unit but will not include cracking equipment. The light products will be distributed locally and any excess fuel and gas oil will be pumped into the crude oil line going to the company's refinery on the Gulf Coast.

The Humble Oil & Refining Co. has similar plans for the building of a small skimming plant, the location of which has not been chosen. In this case also the gasoline will be sold locally and the bottoms will be pumped back into the crude line.

Kansas

The increase in the Kansas refinery runs is due to the general increase in the operations in practically all plants. Higher schedules amounting to a few hundred to 1,000 bbls. daily is shown throughout the entire list with the largest single increase being shown for the Kanotex which will run 9,500 bbls. compared with 7,000 bbls. during June.

North Louisiana and Arkansas

North Louisiana and Arkansas each reported slightly higher runs, the largest single factor in this increase being the starting up of The Texas Company plant at Shreveport. The company has operated this plant intermittently depending upon marketing conditions. It has been closed down for several months but will operate throughout July at an average daily rate of 5,000 bbls.

Except for this change the operations for the entire area remain about the same as June.

West Texas

West Texas refineries showed a slight decrease in operations. This was the only group to report a lower total throughput than June. No general trend may be observed in the schedules of the individual plants, some having shown increased schedule while others were decreased. The only change in the status of the operation and shut down plants is the resumption of operations in the Grayburg Oil Co. plant in San Antonio. Its schedule has been estimated at 1,000 bbls. per day for July.

MID-CONTINENT REFINERY OPERATIONS

CRUDE RUNS TO STILLS

	1929	1930	1931
January 1	508,550	535,460	478,795
February 1	506,800	519,355	470,125
March 1	514,950	531,500	449,634
April 1	530,530	555,250	497,391
May 1	577,500	574,300	510,640
June 1	583,030	572,250	567,915
July 1	565,800	548,475	588,840
August 1	555,250	526,400	.....
September 1	552,300	498,710	.....
October 1	544,720	518,800	.....
November 1	545,473	506,700	.....
December 1	540,630	478,360	.....

OPERATIONS BY DISTRICTS

	July 1				June 1		
District—	No. of plants	Daily crude cap. (bbls.)	Daily crack. cap. (bbls.)	Runs to stills	Plants oper.	Runs to stills	July daily inc.
Arkansas	9	47,800	21,250	29,900	9	26,950	2,850
Kansas	15	150,000	88,200	102,700	15	9,500	7,700
N. Louisiana	5	54,300	18,000	33,125	5	28,025	5,100
Oklahoma	42	335,300	119,150	210,500	42	203,200	7,300
N. C. Texas	46	240,450	63,600	149,960	45	148,440	1,520
West Texas	21	147,600	53,250	62,655	21	66,300	*3,645
Total	138	975,450	363,450	588,840	137	567,915	20,925

*Decrease.

REFINERY OPERATIONS IN OKLAHOMA

(Plants which have been in operation during the past year)

Company and location—	Daily capacity	Runs July 1	Runs June 1
Altitude Petroleum Corp., Oklahoma City	3,000	1,500	250
Anderson-Prichard Oil Corp., Cyril	5,000	4,000	4,500
Barnsdall Refineries, Inc., Barnsdall	6,000	3,500	3,000
Barnsdall Refineries, Inc., Okmulgee	10,000	6,000	6,000
Bell Oil & Gas Co., Grandfield	4,500	2,000	2,000
Black Gold Refining Co., Oklahoma City	1,500	800	850
Capital City Refining Co., Oklahoma City	2,500	800	800
Century Petroleum Co., Tulsa	500	1,000	(*)
Century Petroleum Co., Oklahoma City	2,500	2,000	1,500
Champlin Refining Co., Enid	16,000	8,000	8,000
Citizens Refining Co., Seminole	1,000	(*)	(*)
Continental Oil Co., Sapulpa	10,000	1,500	1,500
Continental Oil Co., Ponca City	30,000	27,000	25,900
Cushing Refining & Gasoline Co., Blackwell	1,800	1,500	1,500
Cushing Refining & Gasoline Co., Cushing	3,500	2,500	2,500
Deep Rock Oil Corp. (Shaffer), Cushing	10,000	10,000	10,000
Eason Oil Co., Enid	5,000	3,000	3,000
Empire Oil & Refining Co., Cushing	5,000	(*)	(*)
Empire Oil & Refining Co., Okmulgee	4,000	4,000	4,000
Empire Oil & Refining Co., Ponca City	12,000	10,000	10,000
Garber Refineries, Inc., and Omar Refining Co., Garber	3,500	2,800	2,200
Globe Oil & Refining Co., Blackwell	7,500	6,500	6,200
Globe Oil & Refining Co., Cushing	15,000	5,000	5,000
Gulf States Corp., Oklahoma City	3,500	3,500	2,000
Illinois Oil Co., Cushing	3,000	(*)	(*)
Imperial Refining Co., Ardmore	5,000	(*)	(*)
Johnson Oil Refining Co., Cleveland	6,000	4,500	5,000
McCullough Oil Co., Oklahoma City	2,000	(*)	(*)
Mid-Continent Petroleum Corp., West Tulsa	40,000	20,000	20,000
Marathon Oil Co., Boynton	2,500	(*)	(*)
Marathon Oil Co., Bristow	5,000	4,500	3,400
Morgan Development Co., Tonkawa	3,000	(*)	(*)
Peppers Gasoline Co., Covington	1,000	700	700
Phillips Petroleum Co., Okmulgee	5,000	5,000	5,000
Producers Oil Co., Bristow	2,500	2,000	2,000
Producers & Refiners Corp., West Tulsa	6,000	4,000	4,000
Pure Oil Co., Ardmore	5,000	2,100	2,200
Pure Oil Co., Muskogee	9,000	7,500	7,500
Rock Island Refining Co., Beckett	3,500	3,300	3,500
Sinclair Refining Co. (Pierce), Sand Springs	8,000	5,000	5,000
Sun Oil Co., Yale	5,000	4,000	4,000
Sunray Oil Co., Allen	7,000	3,500	4,000
The Texas Company, West Tulsa	15,000	14,000	13,000
Texas Pacific Coal & Oil Co., Wynnewood	2,000	1,500	2,000
Tidal Refining Co., Drumright	15,000	10,000	10,000
Western Oil Corp., Beckett	2,000	1,500	1,500
Wewoka Refining Co., Wewoka	2,000	(*)	(*)
White Oak Corp., Allen	8,000	4,000	3,000
Wilcox Oil & Gas Co., Bristow	5,000	2,500	2,000
Wirt Franklin Petroleum Corp., Ardmore	4,000	3,000	3,000
Yale Oil Corp., Yale	2,000	1,000	1,000
York Refining Co., Oklahoma City	3,000	(*)	700
Total	335,300	210,500	203,200

(Continued on Page 116)

New Process for Cleaning Out Wells

Fairbanks and Ranney Plan Is to Generate Heat and Gases in Bottom of Hole to Remove Deposits on Sand Face

By L. G. E. Bignell
Petroleum Engineering Editor

When the material that now makes up the formations from which oil and gas is recovered was laid down it is very evident that water movement played a very important part in transporting it from its source to the place where it is now found. Such water movement is still carried on upon all parts of the earth's surface today and it is therefore possible to make a study of it and from that study reconstruct the conditions that existed ages ago.

As the older rocks were disintegrated by weather, heat and cold, and by the reactions of certain elements in the atmosphere, which may have existed in greater proportions than they are now found, the broken fragments were carried from the mother rock and gradually broken and worn down to fine sands and silts. Some of the soluble portions were dissolved in the water and carried until such time as changes in temperature and other conditions permitted them to be precipitated.

The character of the season during the period of deposition has had its effect upon the type of deposit found today for under conditions of heavy rains and rapid run off of the waters larger and coarser particles of rock were moved and it is also possible that they were carried greater distances from their source.

When the streams were sluggish and waters moved more slowly finer materials were transported and as they were deposited and those elements in solution were dropped out of the water these fine particles formed the cementing material that holds the sand grains together and effect the porosity and the capacity of the sands to hold gas and oil.

The velocity of the waters had a marked effect upon the position of the material deposited and at the points where streams emptied into larger bodies of water there was some tendency for the solids to be classified out with the coarser portions nearer the shore and the fine muds and silts further out and with material carried in solution deposited still further out in the body of water where movement was least.

Effect of Deposition

The sand bodies in the Bradford Field in Pennsylvania are noted for the fine texture of the sand grains and their regular size. There are tight portions of even this very excellent deposit of oil sands but on the whole this field has been referred to as a good example of a uniform sand body.

In other fields many varying conditions have been noted and the porosity, permeability and saturation of the formations vary within very short distances. This is undoubtedly due to the conditions that existed at the time the reservoir rocks were formed.

It is now considered by a number of geologists that the recently discovered East Texas oil pools are due to shore line conditions rather than structural features. It is believed that a stream flowed into the old Cretaceous sea west of the Sabine uplift and carried sands, muds and silts down from the northeast and deposited them along the old shore line.

Wave action distributed these materials along this old coast for many miles and sorted them in such a way that it is now found that cores of the sand bodies in the north end of the pool, or the Longview Field, contain coarse gravel and flat beach pebbles, while the coarseness of the sands and the proportion of sand and shale varies toward the south.

This does not mean that a portion of this vast pool was not formed by the reworking of the Woodbine sands that are known to have existed at the bottom of this old sea, but rather that both conditions played their part in forming this old beach and because the sands were laid down adjacent to shales that were saturated with bituminous materials which later escaped and found a resting place in the more porous sand bodies, this oil pool was formed.

This general method of forming sand bodies, also lime reservoir rocks, has its effect upon the production of the wells that are now drilled into them to secure this oil. As soon as the reservoir is opened by the wells a change in underground conditions begins to take place and the oil, gas and water moves towards the point of lowest pressure.

This point of low pressure is naturally at the well bore and towards it any loose material will be carried and as velocities change because of depletion of the gas energy in the reservoir, and underground pressures are lowered, some of the finer material will tend to find new resting places in the sand and in time will clog up the pores and restrict the movement of oil and gas to the well.

Cleaning Methods

Paraffin base oils tend to drop some of their heavier portions at these points of change in pressure and temperature, and this is likewise true of asphaltic base oils and as a result it is necessary to clean the well face at intervals to permit fresh surfaces to be exposed and more oil and gas produced.

Not only is material from the sand or lime reservoir rocks deposited at the face of the well bore but material will fall from the walls of the open hole and accumulate in the bottom of the well, so it has been a custom of production men to clean their wells with a light string of tools to loosen up the deposit, and it is then removed by bailing and brought to the surface.

Some wells have been cleaned by blowing them with air under pressure by what is known as the Dunn-Smith process used extensively in the eastern fields and to some extent in the Mid-Continent area.

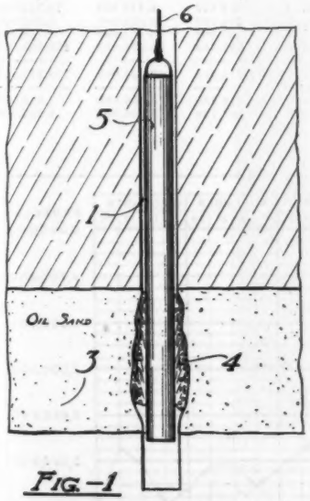

FIG.-1

Fig. 1. Numeral 1 indicates a well casing seated on a cap rock 2 overlying an oil sand 3. The bore of the well is extended through the oil sand and the opening 4 in the sand may be enlarged as by blasting or reaming. A bailer or agitating device 5 is suspended in the casing by a cable 6.

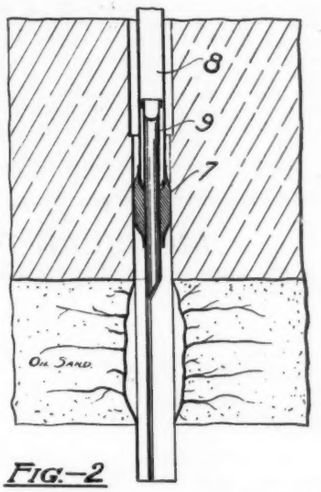

FIG.-2

Fig. 2 shows a packer 7 carried by the end of a string of tubing 8. This packer is of the type which is set by the weight of the tubing and released by lifting the tubing. A tripper 9 may be extended through the packing

Acids have been used to dissolve certain portions of the accumulations in the well and permit them to be bailed out later when mixed with water.

These older methods are all well known to production men and petroleum engineers and will not be described in any detail here for it is the purpose of this article to bring to their attention a new method patented by Charles O. Fairbank, of Petrolia, Ontario, Canada, and Leo Ranney, of New York City, that is based on the generation of heat and gases in subterranean areas to remove the paraffin wax and other types of deposits at the sand faces.

New Method Described

In the patent above referred to and known as No. 1,806,499 issued under date of May 19, 1931, it is claimed that the invention relates to improvements in methods of facilitating flow from wells, especially to the cleaning of oil wells in which deposits of paraffin, calcite or like substances have obstructed the flow from the oil-bearing formations.

The patent describes two methods that may be followed in cleaning the well, one by bailing or pumping to lower the fluid level in the well and then introducing hydrochloric or nitric acid after tubing and other material has been removed from the hole.

The two acids named are preferred to the use of sulphuric acid, although the

(Continued on Page 96)

SALT WATER SITUATION ALREADY SERIOUS IN EAST TEXAS FIELD

By L. G. E. Bignell
Petroleum Engineering Editor

The salt water situation in the East Texas Field is gradually assuming such proportions as to give some concern to the operators in that area and it is reported that the Humble Oil & Refining Co. is building a 600-foot-square salt water disposal pond on its Crim lease in the Kilgore Pool, and that the Magnolia Petroleum Co. is also building such a disposal vat to handle water from its wells in the same pool. Neither company has much water to contend with at this time but some of their wells are making about 3 per cent salt water and they are making preparations to handle water in ever increasing amounts.

From one source it was learned that at least 25 wells, mostly in the Kilgore area were definitely making cut oil and a check of them with regard to their relative position seems to indicate that the water encroachment is due to having finished the hole too deep rather than definite water movement up dip in the structure.

The 25 wells checked in the Kilgore area are probably only a part of the wells making salt water and cut oil, because in the East Texas Field it is difficult to secure definite and complete data upon well operations as many of the smaller operators do not attempt to make information of this kind available and the scouts for the larger companies are too busy with their other duties to be able to visit all properties regularly.

One report for the week ending July 3 showed that there were 13 new wells making cut oil but it may be possible that some of these wells were already included in the report of the 25 wells given above. No map of water movement has been made of the area because of the incompleteness of the data now available.

It is agreed by most geologists familiar with this area that water must be considered as a very serious menace and if wells are produced wide open the possibilities of water coming around the well bottom are imminent. It has been quite definitely established that the present water level in the whole area is about 3,315 feet below sea level datum and if wells are drilled below that depth they will encounter water. This has been proven by the fact that only one well is reported as free of water that has been finished below the 3,315-foot below sea level depth.

That water exists in the formation to the west of the pool is proven definitely and that it is hot and therefore a double threat to oil production has also been checked. It is reported that Magnolia Petroleum Co.'s No. 1 Florey on the west edge of the field had water with a bottom hole temperature of from 155 to 162° F.

Contour maps worked out from drilling logs now show quite conclusively that this pool is a closed structure with a west dip through its central portion and dips to the southwest at the south end of the pool and to the northwest at the north end of the pool. These north and south closures of the producing formation form the trap in which the oil is retained and the eastern closure is produced by the sand thinning out where it contacts the Georgetown lime.

The sand bodies were laid down and formed an old shore and were later warped by movement of the underlying formations so that the conditions found there indicate that this pool is one-half of an anticline type of structure, the eastern half of the anticline being missing because of the position of the Sabine

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New Method of Locating Water Troubles

Electrical Device Used in Producing Wells to Determine Depth at Which Salt Water Is Leaking Into Well

By Robert R. Robinson*

Sooner or later most oil fields are confronted with important water problems. In a great many cases reliable information as to the exact point of water entrance into a well or group of wells is of extreme importance. Often guesses made as to the location or cause of the water trouble are greatly in error. Procedure based upon such guesses often entails a great deal of expense and is not productive of the results desired. Many times it is only after extensive repair work has been made that it is found impossible to exclude the water without also excluding or greatly reducing the oil as well.

Accurate knowledge of this fact is particularly important after a cement test, when water is found to be entering the hole. Often it has been found to be coming in below the shoe rather than around it—sometimes through a casing leak where it has not been cemented all the way to the shoe of the last string. In a recent case a great deal of time and effort was spent trying to secure a shut-off just above a known oil sand into which (though the fact was not then known) edgewater had already entered. Every indication pointed to the fact that the water was coming around the shoe, when it was really coming from below.

Often it is important to determine the progress of edgewater accurately in different strata of the same producing sand. Water will often encroach along widely different fronts at different levels in a sand of considerable depth. Some wells may be making water from a deep stratum only, others from a shallow one only, and still others from both. Repair work may be possible to clean up the production in some of these wells; in others it may be useless to try; in still others, from studies made on adjacent wells, it may be found that water encroachment in various levels is so near that the repairs would not pay. Definite data are necessary to arrive at such conclusions, and such data can only be obtained by a systematic study of water conditions in the wells affected.

Unusual Conditions

Many unusual conditions have been found to exist in certain cases, each of which is almost a study in itself. In one case water was entering in several wells along a fairly well defined path. The natural assumption would be edgewater. Actually it proved to be that a highly corrosive water had finally gone through the casing. This water was considerably above the producing formation. In another, which is later described, a high head water was flowing through the well and entering a producing sand below.

Definite data on these water problems are being obtained in California and some foreign fields, by an interesting method, which, where proof has been possible, has shown the correct condition in considerably higher than 95 per cent of its runs. It is interesting to know that the contentions of operators, prior to the tests, has proven wrong in over 50 per cent of the runs. Considering the unusual conditions often found, a percentage of 95 is high.

Description of Method

This method consists in first conditioning the well to create a fluid column which differs measurably in its electrical resistance from that of the natural well water. This is accomplished by any one of several different methods, depending upon the condition existing at the well and the equipment available. After conditioning, the instrument, or "water-witch" as it is called, is lowered into the well, upon an insulated cable. Cable drum, measuring wheel, control and accessories, are all mounted upon a truck. The truck engine furnishes the power for operating the drum through the usual power take-off. Slip rings on the drum, to which the cable ends are attached, permit continuous supplying of a low potential current to the instrument within the well. Within this instrument are two electrodes, a definite distance apart, and exposed to the well fluids. The cable and the electrodes are connected through the slip rings on the drum into a wheatstone bridge circuit which also contains a variable resistance for balancing the circuit. An alternating current galvanometer allows the operator to quickly and accurately balance the circuit. The value of the balancing resistance is recorded at each depth interval

(Continued on Page 75)

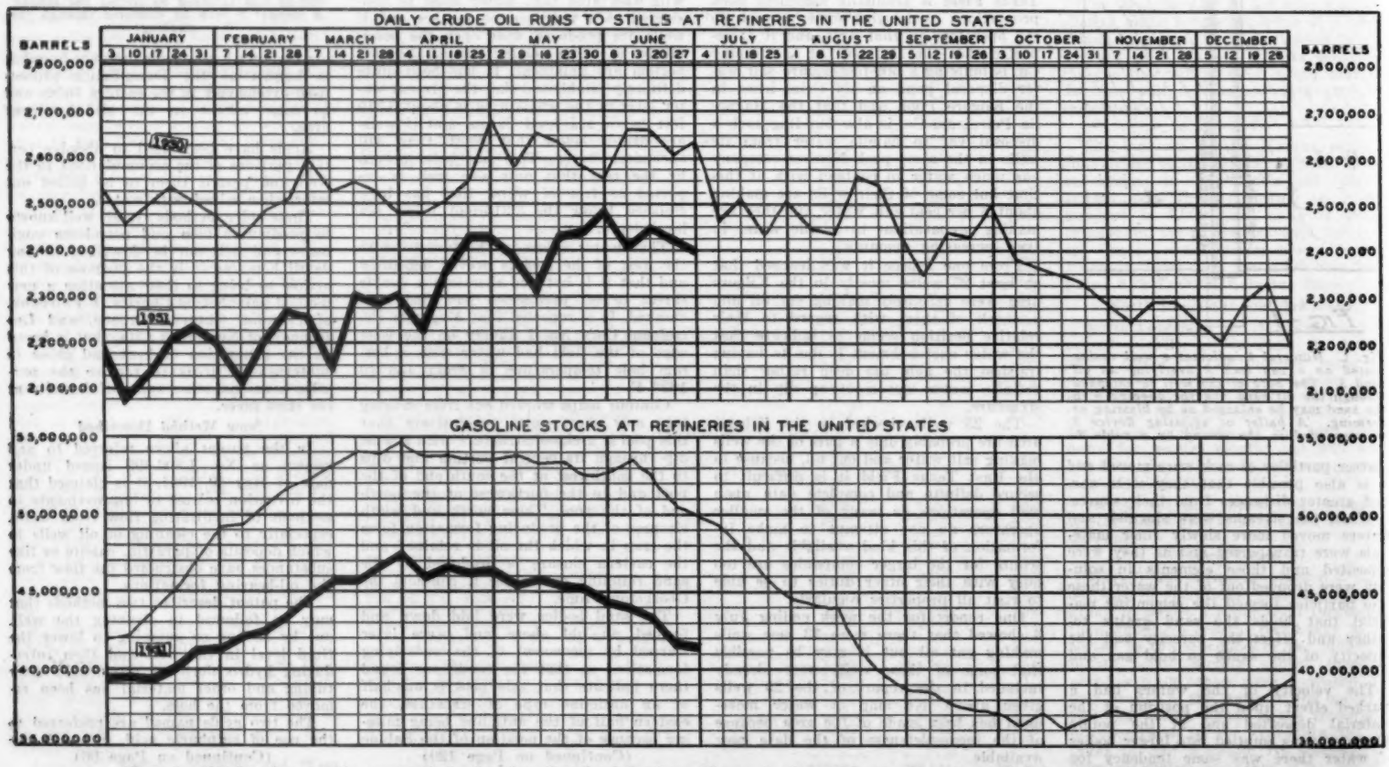
*Consulting mechanical engineer, Los Angeles, Calif.

AMERICAN PETROLEUM INSTITUTE WEEKLY REFINERY STATISTICS

The weekly report made to the American Petroleum Institute on refinery statistics—crude runs to still, gasoline stocks and gas and fuel oil stocks in barrels—for the week ending July 4.

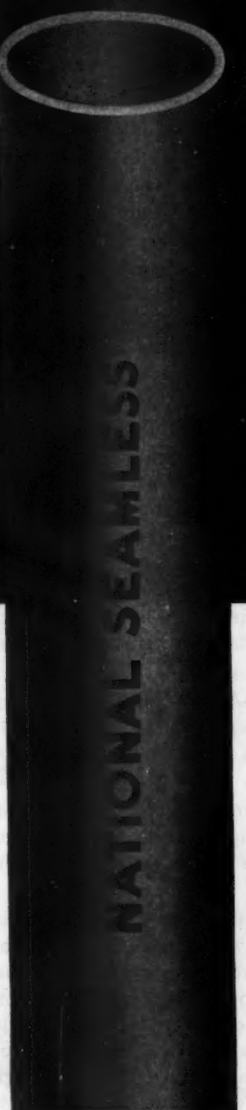
	Week ending July 4				Week ended June 27				Week ending July 5, 1930			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
East Coast	100 0	459,300	7,134,000	9,587,000	100.0	461,300	7,568,000	9,424,000	100.0	467,900	8,134,000	9,210,000
Appalachian	91 8	86,400	1,479,000	1,202,000	91.8	108,300	1,558,000	1,236,000	91.8	70,400	1,632,000	935,000
Indiana, Illinois, Kentucky	96 6	307,600	6,994,000	3,804,000	96.6	321,300	6,311,000	3,766,000	99.6	290,900	7,864,000	4,112,000
Oklahoma, Kansas, Missouri	89 6	273,900	2,876,000	4,834,000	89.6	282,300	3,284,000	4,692,000	89.9	281,700	4,497,000	4,760,000
Texas	91.3	533,100	7,262,000	10,405,000	91.3	547,100	7,927,000	10,342,000	90.4	559,800	6,843,000	10,516,000
Louisiana and Arkansas	93 9	165,900	1,360,000	2,745,000	98.9	177,600	1,541,000	2,602,000	96.8	166,900	2,320,000	1,883,000
Rocky Mountain	89 3	42,400	1,766,000	853,000	89.3	46,100	1,333,000	862,000	93.6	67,400	2,678,000	1,187,000
California	96 5	466,100	11,727,000	97,937,000	96.5	472,900	11,856,000	95,122,000	99.3	583,300	15,076,000	106,535,000
Total United States	94.7	2,334,700	39,698,000	131,367,000	94.7	2,416,900	41,868,000	131,045,000	95.7	2,478,300	49,034,000	139,138,000
Texas Gulf Coast	99 8	418,700	6,118,000	7,401,000	99.8	414,600	6,777,000	7,277,000	100.0	419,100	5,656,000	7,516,000
Louisiana Gulf Coast	100.0	114,100	1,366,000	1,839,000	100.0	118,900	1,433,000	1,662,000	100.0	117,100	1,936,000	1,049,000

(1) Per cent refinery capacity represented. (2) Daily crude runs to stills. (3) Gasoline stocks. (4) Gas and fuel oil stocks.



*Data for 1931 based on weekly reports of the American Petroleum Institute. Figures for last week not shown in graph but are included in above tables.

NATIONAL USS STAINLESS AND HEAT RESISTING STEEL PIPE and TUBES



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INCREASING CONFIDENCE

Despite the delays in East Texas there is an undercurrent of confidence in the industry that the situation there will work itself out.

Most people share the opinion credited to Governor Sterling that there is no chance of East Texas producers obeying the new 250,000-barrel limit when they had already disregarded a 300,000-barrel limit. Moreover the new allowable, treating each well as a unit regardless of potential, is so manifestly inequitable that it is sure to arouse protest and add another legal tangle to the perplexities that already await judicial determination.

There is no hope of speedy solution under the existing law. Whatever orders the commission may issue can be ignored or thrown into litigation and overproduction continued unchecked.

That was shown when the commission's original 160,000-barrel limit was disregarded and when the 300,000-barrel voluntary limitation was equally ignored. It is about to be demonstrated again by like disregard for the new 250,000 allowable set by the state commission.

By this time it ought to be clear to everybody that there is no use making further futile efforts along that line under the present inadequate laws.

Since the present commission is without sufficient authority to enforce its orders, which can be postponed indefinitely by litigation, it will be a waste of time to repeat these useless motions.

If Texas is going to curb wasteful overproduction of oil, and there is no doubt about that intention, the legislature will have to be called in special session to pass a law that will empower a state commission to enforce its orders and provide for expediting judicial determination of cases arising under it.

A law which can be defied by prolonging litigation until all the damage is done would be worthless. The East Texas Field is too valuable to be subjected to such risk of destruction, to say nothing of the damage done to the oil industry whose prosperity is so important to the progress of the State.

Even the East Texas landholders who were deluded into thinking that their one chance of making money was by immediate production of their oil at any price are finding that they are not getting what they expected.

The notion that the big companies had some scheme against the little fellows in urging restriction of production does not look so plausible now when it is seen that the big companies are strong enough financially to weather the gale no matter how long it lasts.

It was not a big company proposition but a proposition for saving the industry, a large number of people, many of them smaller operators who cannot continue to operate indefinitely at a loss.

Right now if East Texas is brought into line it is entirely possible there could be a substantial improvement in price conditions in both the crude and refined market.

As shown by the latest report of the Bureau of Mines covering the month of May and current data from the American Petroleum Institute the statistical position of the industry so far as inventories are concerned is substantially better than it was a year ago.

Gasoline stocks are 9,000,000 barrels less and stocks of other refined products are also less while there are 40,000,000 barrels less crude in storage than at this time last year.

During these summer months it is reported we are having the highest gasoline consumption on record, although no comparable accurate figures are yet available. It is believed domestic consumption is running at least as high as last year and while exports fell into a decline in the latter part of last year and the first part of this year they are now showing a tendency to grow.

In short there is no reason why the industry should not recover its loss during the early part of the year in the next few months of maximum consumption if producers and refiners will realize the situation and avoid overproduction.

Oklahoma has done its share towards stabilizing the industry. So has Kansas and most of Texas. California, which faced a condition which was worse than in any place else in many respects, has been able to accomplish more in curtailing crude and refinery overproduction and at the same time liquidating a part of its heavy inventory.

In the Bradford-Allegany Field adoption of the curtailment policy, cutting production in half to meet demand, has enabled operators there to obtain as much for their oil as all East Texas gets for its more than ten times as much production.

East Texas is going through the same educating experience as other flush producing areas in recent years. Seemingly hopeless situations have worked themselves out. The oil business is not going to rack and ruin.

Certain units, some large and some small, are in position to grapple successfully with almost any situation that can materialize.

But if overproduction is continued it must lead direct to bankruptcy for many who under proper conditions have a place in the industry. If, on the contrary, they lend their aid to checking disastrous trends and assist in stabilizing production with demand there will be room and reward for every legitimate interest in the business.

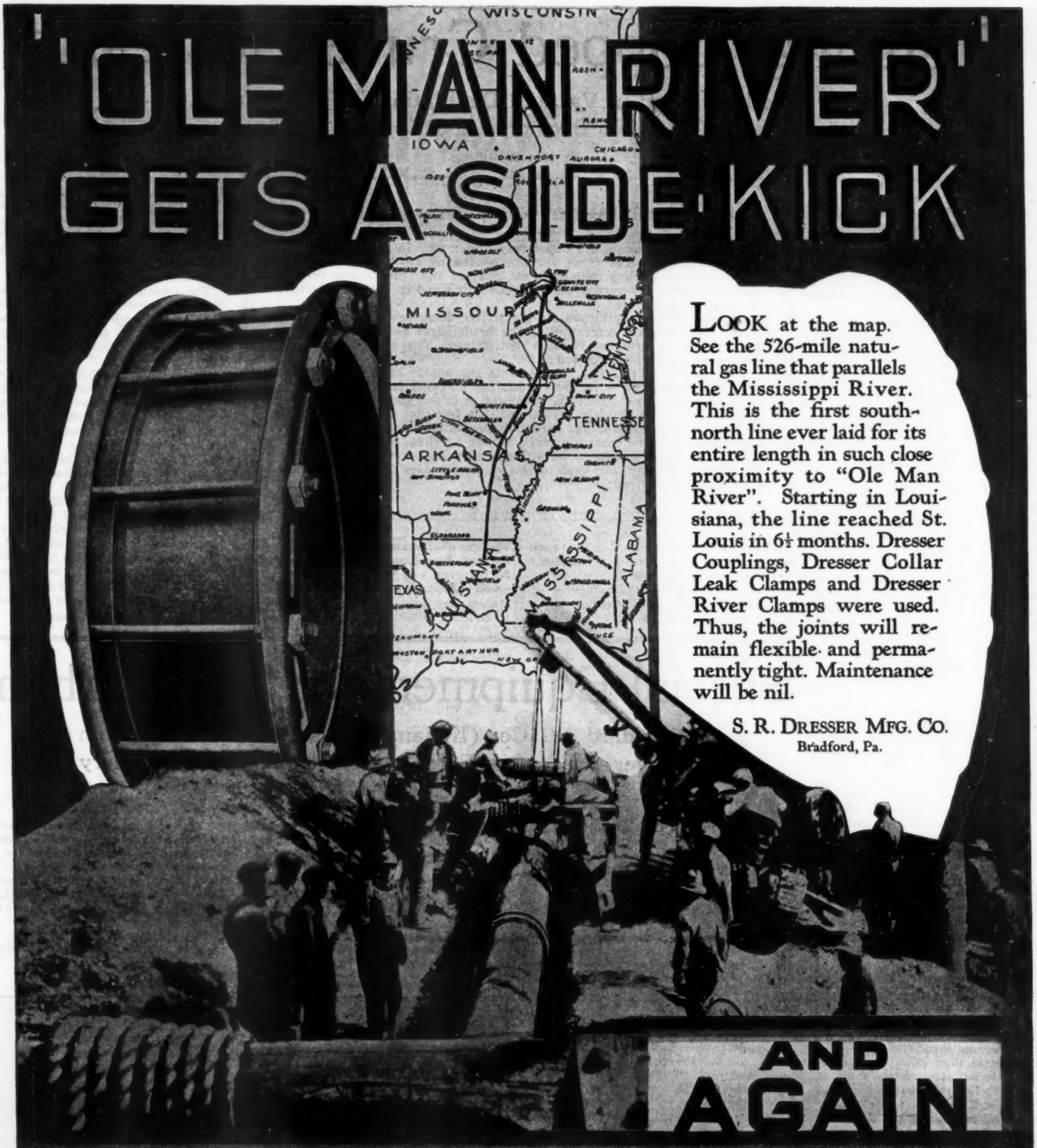
It is simply a matter of taking enough medicine now and avoiding greater evil hereafter.

This is the broad view taken by companies having far-seeing management. They are willing to forego a temporary gain which means ultimate loss, preferring wisely conservative but consistent progress for the welfare of the industry as well as of themselves and for the effect it will have on the general business situation throughout the country in these days of reconstruction.

As the days go by exposing the actual losses sustained from overproduction, losses that eventually affect everybody in the business, saner counsel is bound to prevail as it finally has in every other crisis.

Recovery can be hastened by energetic support from the industry at large. Efforts should be made to unite the industry upon a definite plan to be placed before the Texas legislature which should be guided by the expert knowledge of those familiar with the operations and problems of the industry. Whatever laws are enacted should command the co-operation of the industry as in other states where the officials and oil men are harmoniously and successfully carrying out a policy that is for the good of all.

"OLE MAN RIVER" GETS A SIDE-KICK



LOOK at the map. See the 526-mile natural gas line that parallels the Mississippi River. This is the first south-north line ever laid for its entire length in such close proximity to "Ole Man River". Starting in Louisiana, the line reached St. Louis in 6½ months. Dresser Couplings, Dresser Collar Leak Clamps and Dresser River Clamps were used. Thus, the joints will remain flexible and permanently tight. Maintenance will be nil.

S. R. DRESSER MFG. CO.
Bradford, Pa.

AND AGAIN

DRESSER COUPLINGS DOMINATE

Distilling Topped Crudes for Lubs

Methods Used in Vacuum Distillation Reflected in Results Obtained. Decolorization Factor a Problem

By Max B. Miller*

In undertaking a discussion with relation to the centrifugal dewaxing of heavy overhead stocks such as are produced for lubricant manufacture by means of vacuum distillation, it is assumed that everyone is sufficiently familiar with the centrifugal manufacture of bright stock and the dewaxing of long residuum so that no comment regarding these prior developments is necessary here.

There is one point, however, with regard to the handling of these residual stocks which should be mentioned, in as much as it has served as the principal impetus back of the later developments which have led to the use of vacuum distillation and the consequent centrifugal dewaxing of the resultant distillates. The decolorization of the raw stocks from which lubricants are manufactured is referred to. Of all the various steps which enter into the manufacture of finished lubricating oil, whether the product is manufactured from the handling of a residuum or an overhead, no one step is so expensive and so inconvenient as that of bringing the oil to final color.

In fact, the idea of producing the heavier stocks by virtue of bringing them overhead by means of vacuum distillation was fostered by the desire of concentrating asphaltic impurities in a still residue so that the overhead stocks could be brought to final color with less loss and less expense than had been the case where residues of similar character had formerly been treated.

Like most new developments, however, the use of vacuum stills for the production of heavy lubricating oils was at first applied in fields in which there was really no economic value. For instance, a number of units were installed in the Pennsylvania field in which it was the intention to produce overhead bright stocks. However, even though these installations were successful in operation so far as the production of pressable wax distillates was concerned, and did produce an overhead stock which could be centrifugally dewaxed, the fact remained that the still bottoms resulting from the operation were of such a high percentage that the refiner could best run to a steam refined stock residuum, filter the residual product thus reduced, dewax the filtered oil and produce more value than could be effected if the heavier stock were taken overhead. In the handling of Pennsylvania oil, acid treating is not permissible, and the losses to still bottoms as a result of the vacuum distillation procedure were far greater than those experienced where the residual stock was filtered to color. This being the case, the use of the vacuum still for the production of heavy overhead lubricating oils is limited entirely to the handling of mixed or asphalt base crudes wherein if similar oils were produced as a residuum the loss from subsequent acid treating would be far in excess of that experienced where the overhead stock is produced instead.

Saving in Acid

In this particular field, however, it would seem that the production of heavy overhead stocks and the subsequent centrifugal dewaxing of them is most desirable for a number of reasons. In the first place, the cost of acid treating residual stocks to present lubricating oil standards, even from selected mixed base crudes, is excessive. Sludge losses from the treatment of such stocks with very few exceptions will range from 35 to 50 per cent of the stock so treated. The acid dosage required in the treatment of these stocks ranges from 30 to 60 pounds of acid per barrel. In the case of residual stocks from many of the mixed base crudes the acid required for treatment and the consequent loss is such as to preclude the profitable manufacture of finished lubricating oil from them.

By producing heavy overhead stocks by vacuum distillation, the quantity of acid required is reduced upon the average by 50 per cent, and the loss to sludge as a result of such treatment in many instances has been reduced by two-thirds. In addition to that, the use of the vacuum still in the production of these stocks eliminates the necessity of selecting, allocating and handling selected crudes for the purpose, it being recognized in most instances, at least, that with the vacuum still an oil of first rate quality can be produced from the pipe line run of paraffin bearing or mixed base crudes.

The economies resulting from the production of overhead stocks by vacuum distillation which are suitable for centrifugal dewaxing and lubricating oil production are more than sufficient to warrant the procedure if this were the only result to be accomplished. However, in addition to these economies, it would appear that the overhead stocks produced are of a better quality than would be possible in the case of producing an oil of similar viscosity from a residuum. The flash and fire test of the oil with relation to its viscosity is much higher, and the viscosity temperature curve for the overhead stock is much flatter than in the case of a similar residual product.

When the idea of producing heavy overhead lubricants was first suggested, there was considerable doubt as to whether the resulting product could be successfully centrifugally dewaxed. It has been well known for some time past that the cen-

(Continued on Page 125)

PROBLEM NOT ENTIRELY SOLVED

New developments are constantly under way in the manufacture of lubricating stocks from various grades of crude oils. Greater yields of improved products is the goal of the refiner and the accomplishments are comparable to those obtained in the manufacture of light oil products.

In the accompanying article the writer discusses recent developments with special reference to the centrifugal dewaxing of overhead stocks secured by vacuum distillation. The writer draws the following general conclusion:

"It may be said that a considerable amount of headway has been made in connection with the production of centrifugally dewaxable stocks by vacuum distillation. However, it is not considered that the problem has been entirely solved and it is felt that the final solution will come only when it has been commercially established that it is feasible to produce from the crude a base overhead lubricating stock which can after dewaxing be subsequently fractionated by further vacuum distillation into each of the various grades of lubricating oil that may be required."

*Paper presented at A.S.M.E. meeting, Elizabeth, N. J.

Special Equipment for Fire Fighting

Standard Oil Co. (Indiana) Uses Portable Aluminum Tower and Trained Force of Men at Wood River Refinery

By L. C. Moore
Standard Oil Co. (Indiana)

Not many years ago, an outbreak of fire in any large oil refinery was followed by a series of blasts on a large fire whistle, which reached everyone within a mile or two. With the development of the highly mechanized modern refinery, the reduction in man-power, and the closer attention given to economies of all kinds, it became necessary to change fire-fighting methods. It was no longer possible for a small army equipped with hose carts to converge on a fire—men could not leave their complicated refinery apparatus at a moment's notice. The increase in electrical equipment, including high voltage transmission lines, made it impossible to use hose streams at many points, for the circuits could not always be opened promptly, and cutting out a large sector at the central power station would shut down other process work. Moreover, since casualties were relatively few, it was felt only humane to reduce to a minimum the use of the old general alarm, which needlessly aroused vague fears in so many families.

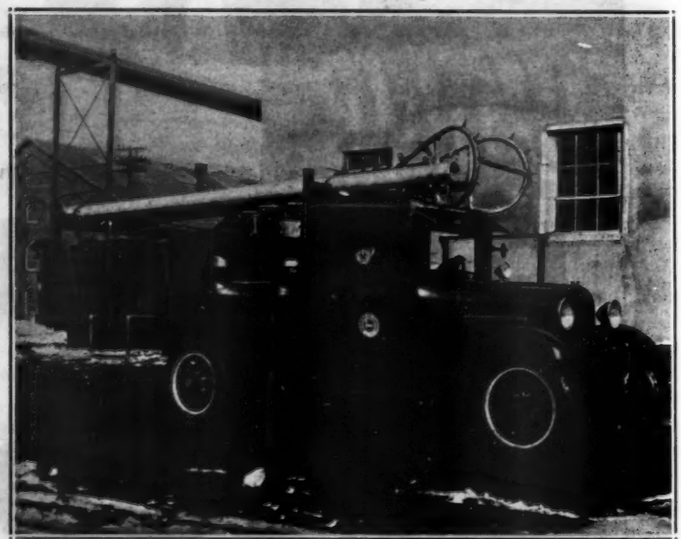
Discontinue Whistles

Consequently, when progress brought about a modernizing of the fire-fighting methods at the Whiting, Ind., plant of the Standard Oil Co. (Indiana) one of the first steps was the elimination of the large plant whistle as a general fire signal. The plant was divided into zones, and a zone signal fire alarm system was installed. These signals are of the electric siren type and have been found very satisfactory. The zones are shown with their numbers on a map in all plant telephone directories so that all employes may become familiar with them. The electric siren system is tested every Friday at 11 a. m., and any defective signal is reported at once by the local department head to the electrical department. To illustrate the operation of the system the following instructions in the plant telephone directory are quoted: "When help is needed in fighting any fire the shift foreman or general foreman shall call the telephone operator, give his name, the location and zone in which the fire occurs, and designate the zones from which help is to be called. If a sufficient amount of help does not respond to the first call, the operator may be requested to sound the alarm in additional zones." During the two-night shifts the alarm is sounded in all zones, and the telephone operator notifies the department heads and members of the management by phone when necessary. The large whistle is reserved for major conflagrations, when it is necessary to call back to the plant employes who are off shift.

Motorize Equipment

Up to a short time ago the Whiting

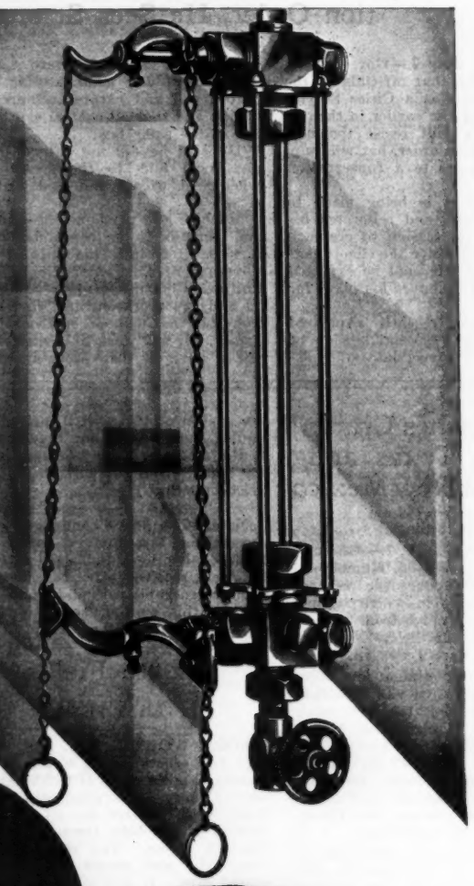
(Continued on Page 122)



One of the specially equipped trucks at the Wood River plant, showing the manner of mounting the aluminum tower. The tower may be made up with one, two or three sections and the entire weight including stand and tip is but 190 pounds.

PENBERTHY PRODUCTS

WHERE SERVICE IS SEVERE USE THE PENBERTHY NAVY TYPE GAGE



THE Penberthy Navy Type Gage is of extra heavy construction throughout. Its dependable operation results from its exceptionally rugged design, careful workmanship and the fact that it is made from new metal. These are important reasons why this gage is so generally preferred in the refinery, the natural gasoline plant . . . in fact, wherever conditions are severe.

These characteristics are not peculiar to the Penberthy Navy Type Gage . . . they apply equally to Penberthy injectors, lubricating devices and other types of Penberthy gages. Penberthy Products are carried in stock by supply houses everywhere.

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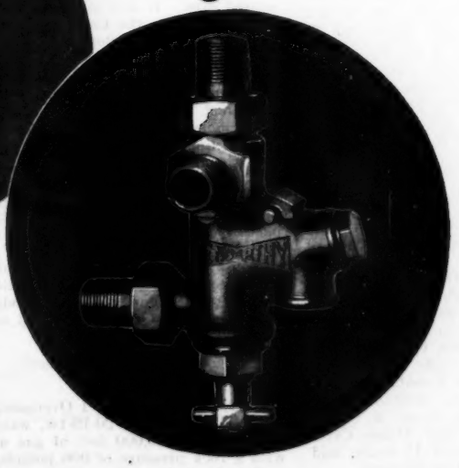
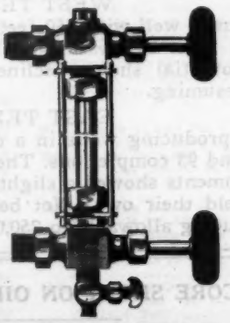




"SURE-DROP"

"SENTRY"

"SATURN"

"SCREW TOP"

"SILEX"

"SAMSON"

Sterling Is Strong for Special Session

Informed by Arkansas Fuel Oil Co. That It Will Resist New Proration Order, He Sees Strong Law as Only Remedy in East Texas

AUSTIN, Tex., July 7.—Gov. Ross S. Sterling said today that officials of the Arkansas Fuel Oil Co., a Cities Service Co. subsidiary, told him earlier in the day that the company will resist the new East Texas proration order, but will support the move to create a conservation commission.

He said no effort is being made to obey the new orders, and reiterated his belief that a special session to create a new commission will solve the chaotic situation in the field. He said he expected within 24 hours to announce his plans for the session.

Governor Sterling recently expressed the conviction that a special session of the legislature will consolidate state departments and bureaus into a conservation commission administering oil, gas, water, soil and natural resource conservation and that oil control can be embodied in the same law.

He said he did not intend to submit any local bills to the special session, when held, except "life and death" matters.

Much of the personnel of departments and bureaus to be consolidated can be carried over into the unified agency, Governor Sterling said. He believes the Railroad Commission, now administering oil and gas proration and pipe line control, will not oppose creating the new agency, but will work in harmony with it.

The bureaus that probably would be merged into a strong central conservation commission are: Oil and gas division of railroad commission, gas utilities division of the railroad commission, state board of water engineers (a three-member department), state reclamation department, and possibly agencies dealing with soil conservation now under supervision of the department of agriculture and A.&M. College.

Governor Sterling declared taxation will not be submitted at the special session.

Only the conservation subject and congressional redistricting will be offered, he said. Local bills will not be submitted, except where extreme importance is shown. Governor Sterling will not hesitate to veto bills passed in the hope that his approval would be a substitute for his submission of the subject.

Most of the technical personnel of the departments and bureaus he wants to see consolidated still would be required in the conservation agency, Governor Sterling said. The new law should function promptly and effectively, since much of its machinery would be assembled from different existing agencies.

Members of the legislature are urging the session to meet the need, Governor Sterling was convinced. The governor saw no chance for oil operators in East Texas to obey a 250,000-bbl. limit when they already had been allowed a 300,000-bbl. production.

Humble Slashes Crude Prices in Texas and Southeast New Mexico

By Nell Williams

HOUSTON, Tex., July 7.—Effective Wednesday morning, July 8, Humble Oil & Refining Co. will reduce the price of crude oil in all fields in which it purchases. The cut will range from 9 to 17 cents according to the field. No price will be posted for East Texas oil.

East Central Texas crudes, including Mexia, Powell, Boggy Creek, Richland, Wortham and Currie, together with North Texas and Ranger and Moran crudes, will be reduced 15 cents. The new prices follow: Below 29 gravity, 10 cents, with 1 cent additional for each degree upward to 40 gravity and above at 22 cents. The posting for Cooke County crude will be eliminated.

Gray County, Panhandle, crude will be cut 11 cents with the new prices as follows: Below 35 gravity, 13 cents, with 1 cent additional for each degree to 40 gravity and above at 19 cents.

Carson and Hutchinson County, Panhandle, crudes will be reduced 10 cents with the following new prices: Below 35 gravity, 11 cents, with 1 cent additional for each degree to 40 gravity and above at 17 cents.

All West Texas crudes, including Winkler, Pecos, Crane, Upton, Crockett, Ector, Howard and Glasscock Counties, and Lea County, New Mexico, will be reduced 15 cents to a flat price of 10 cents.

New prices for the Gulf Coast, including Refugio light crude, will be: Below 25 gravity, 31 cents, with 1-cent differential for each degree to 35 gravity and above at 42 cents. This is a cut of 13 cents. Refugio heavy crude will be posted at 35 cents, a cut of 9 cents.

In Southwest Texas, Mirando crude will be posted at 35 cents, a cut of 9 cents; Salt Flat and Darst Creek crude, 20 cents, a cut of 17 cents, and Pettus, 35 cents, a cut of 15 cents.

In a statement to be issued by W. S. Farish, president of the Humble Oil & Refining Co., blame for the crude reduction is placed entirely on the East Texas Field.

Mr. Farish's Statement

"With East Texas crude oil selling at almost any price a buyer is willing to pay, product prices have declined from the deplorably low base existing a month ago when we withdrew our East Texas posting. We had hoped for improvement. The reverse has happened. Litigation already has been started to make ineffective the latest Railroad Commission order. The volume of East Texas production continues to dominate product prices in our entire market structure. Under these conditions it is impossible to maintain the parity of prices announced in our April 21 price bulletin, and it is impossible for the Humble Oil & Refining Co. to pay longer the prices for other crudes named in its June 3 price bulletin."

Note.—The above changes in price in Texas and Lea County, New Mexico, crude oil by the Humble Oil & Refining Co. were received after the close of the regular crude oil price tables in another part of this edition, and are therefore not to be found in the regular table.

Late Fields

EAST TEXAS

FORT WORTH, Tex., July 7.—Taxman and others' No. 1 Callahan, Evans Survey, 2 miles north of Gdalewater, Upshur County, was completed at total depth of 3,733 feet for an initial production of 135 bbls. through three-quarters-inch choke. The elevation is 408 feet. The well shows 41 feet of saturated sand. It is a northern and western extension to the Lathrop Pool.

Sabine Oil & Development Co.'s No. 1 Harris, in the Van Winkle Survey, south and east of the Kilgore Pool, Rusk County, is shut down in Georgetown lime at 3,066 feet. The lime was topped at 3,569 feet, more definitely determining the eastern limits of this pool.

National Securities' No. 1 Vernon, in the William Avery Survey, approximately 1 mile west of Selby Oil Co.'s No. 1 Snavely producer in Gregg County, apparently is a dry hole. It is now standing shut down at a total depth of 3,623 feet in a dry sand. The top of sand is at 3,621 feet, elevation 302 feet. This is a west edge well and will limit production in Gregg County unless saturated sand is cored deeper.

KANSAS

Harris & Hann's No. 1 Overman, NW cor. NE SE Section 20-19-1w, was completed for 29,800,000 feet of gas a day, with a rock pressure of 900 pounds. The well is located in the northeast part of the Ritz-Canton Pool in McPherson County, Kansas. The gas was found in the chat at 2,915-70 feet. The well brings gas production nearer the townsite of Canton, which has recently passed an ordinance prohibiting the drilling of wells inside the city limits.

OKLAHOMA

The discovery well in the Oklahoma City Field completed by the Indian Territory Illuminating Oil Co. in the C SE SE, Section 24-11-3w, on December 4, 1928, at a total depth of 6,498 feet, which made 4,848 bbls. of oil the first 24 hours, will be plugged back to the shallow gas horizon. The total depth of the well is 6,624 feet from which it has produced

(Continued on Page 120)

High Spots in Field News

OKLAHOMA

Oklahoma City production increasing. Hits new peak. Potentials to be passed over for next three months.

SOUTHWEST TEXAS

Guadalupe County test more encouraging. Extension of Bruner Field to south indicated. New test in Bastrop area.

ROCKY MOUNTAIN AREA

Increasing activity in eastern Colorado. Converse County, Wyoming, core hole has flow of million feet of gas.

KANSAS

Kansas wants increase in output, claiming state has been underproducing. Increased potential and pipe line facilities.

GULF COAST

Coastal production held under maximum allowance. Two Barbers Hill deep tests swabbing salt water. Abandonments in Calhoun County and Montgomery County.

NORTH LOUISIANA-ARKANSAS

Bossier Parish wildcat attracting attention. Rhodessa deep gas test interesting. More activity in Shelby County and Zwolle. Six new tests in Mississippi reported.

CALIFORNIA

Conferences being held to promote adherence to curtailment plan after new gasoline war outbreak and proposed referendum on Sharkey gas conservation law threatened delay until end of 1932.

WEST TEXAS

Loving County well with 550 feet of oil in hole to be given another shot, oil from Delaware sand being high gravity and sweet. Yates Pool potential shows decline of 325,818 bbls. Schleicher County well resuming.

EAST TEXAS

Now 1,070 producing wells in a district with 62 new locations during week and 93 completions. There were 567 drilling activities recorded. Shipments showed a slight decline except to local refineries which held their own. Not believed producers will respect new order reducing allowable to 250,000 bbls. daily.

SCORE SHEET ON OIL PRODUCTION

Below is shown the allotted average daily production in the United States from April 1 to October 1, 1931, suggested by the Oil States Advisory Committee, and the actual daily average production in the week ending July 4:

	Barrels			
	Allotted	Actual	Over	Under
Texas	714,000	971,794	257,794	.....
California	500,000	507,750	7,750	.....
New Mexico	40,000	45,006	5,006	.....
Oklahoma	550,000	590,960	40,960	.....
Louisiana	65,000	59,155	.....	5,845
Kansas	110,000	102,890	.....	7,110
Arkansas	50,000	43,915	.....	6,085
Eastern	110,000	108,000	.....	2,000
Rocky Mountain fields	60,000	53,955	.....	6,045
Total	2,199,000	2,483,425	311,510	27,085

Total net daily average overproduction 284,425 bbls.

East Texas Has 1,070 Producing Wells

Many Wells Have Quit Flowing and Will Be Pumped. Average Price in Field in June Was 15 Cents per Barrel

By L. E. Bredberg
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., July 6.—Drilling activities have fallen off somewhat in the East Texas district within the past few weeks, but there are still plenty of tests going down to swell the potential production of the district each day. Many new locations are being announced each week, although they too fell from 82 last week to 62 this week, while completions fell from the peak of 104 last week to 93 this week. Later weeks may surpass last week's number of completions, but it is doubtful in the face of conditions, which are growing worse for everybody in the field except those who are buying cheap oil for refining purposes, or those who have plenty of outlet, and empty storage.

There were 578 drilling activities recorded in last week's report, whereas this week they have fallen off slightly, to 567 tests.

Crude Oil Shipments

Tank car shipments and trunk line shipments both showed a small decline in this week's report while shipments to local refineries held their own with the previous week's shipments. Runs through trunk lines fell off from 203,145 bbls. to 193,710 bbls.; tank car shipments fell from 114,300 bbls. daily to 109,705 bbls. daily. Shipments to local refineries for the week averaged 24,490 bbls. per day, whereas the daily average of the previous week was 24,920 bbls. Runs to local storage showed a gain of almost 7,000 bbls. per day, from 17,375 bbls. as of June 24 to 24,070 bbls. per day as for the week ending July 2. Total shipments and runs to storage averaged 351,950 bbls. per day for the week ending July 2. This is 100,000 bbls. per day over the new allowable set by the railroad commission in its latest proration order issued July 2, 1931, at Austin. The total daily allowable set out in that order is 250,000 bbls. This is 90,000 bbls. more than the previous allowable of 160,000 bbls. per day.

1,070 Producing Wells

There are now 1,070 producing wells in the district.

At the present time there are 167 drilling wells in the Joiner area, 164 in the Kilgore area, and 144 in the Lathrop area. There were 34 producing wells completed in the Joiner area this week, 31 in the Kilgore area and 24 in the Lathrop area.

Regardless of the increase in the size of the daily allowable of the East Texas district it is hardly believable that the operators and companies will adhere to this new order and cut their production accordingly even after concessions have been made by the commission to bring everyone into line and try to get their co-operation in curtailing the production. If the order is observed it will undoubtedly help the East Texas situation to some extent, but if it goes unheeded large quantities of oil may be sold for as low as 5 cents per barrel within the next two or three weeks, more of the companies having abandoned posted prices today, July 6.

Postings Withdrawn

Gulf Pipe Line Co. withdrew postings today, and the Sinclair Refining Co. withdrew postings on July 3 and cut off all outside connections, making it still tougher on the independent operator who has been selling to Sinclair, and depending on that company to continue to take its oil.

The Humble Oil & Refining Co. announced by letter to royalty owners that it would observe a price of 15 cents per barrel for the period of June 3 to 30, inclusive. This price will be cut if the average price of the fields falls below this amount, as per previous announcement made by the company when it withdrew its postings in the district.

The Simms Oil Co. was another company that cut off all outside connections on July 3, and is now paying only 10 cents per barrel for oil being taken from three leases in the Lathrop area, Gregg County.

If the new proration order, just issued, is not obeyed by the producers, a special session of the legislature is inevitable, for Governor Sterling is of the opinion that only special legislation can help the industry in the State now, proposed plans having gone to nought in the East Texas district due to lack of co-operation. Police power, and wielding of a heavy stick of the law seems to be the only thing that will have any persuasive power in bringing the producers to shut in their wells. The threat of salt water has apparently had no influence with most of them, and the gradual lowering of crude prices has been no deterrent in producing many of the wells at their maximum.

The Kilgore Field produced a daily average of 144,648 bbls., the Lathrop area 94,950 bbls., and the Joiner area 112,374 bbls. per day for the week ending July 4, making a total daily average of 351,972 bbls., giving one reason for the present low price of crude in the field, or at least an alleged reason for such prices as 10 cents per barrel for 40 gravity crude.

The water situation in East Texas has not changed to any great extent, due to operators in the Kilgore Field, where the water intrusion is greatest, pinching in their wells to prevent the water from gaining headway as rapidly as it would if the wells were produced wide open.

Stanolind Oil & Gas Co. and Weaver's No. 1 Everett in the Goodman Survey, 1½ miles north of Gladewater in Upshur County, has been reported as making 35 per cent b.s. and salt water. Subsea datum of the top of the sand is minus 3,261 feet and same datum at total depth is 3,324 feet. It was completed last week making 104 bbls. the first hour through tubing. This well apparently marks the western limits of the Lathrop area, and adds to the fear of water encroachment from the western side.

Important Extension

Taxman and others' No. 1 Mrs. Ann Callahan in the A. J. Evans Survey, 2¼ miles north of Gladewater, Upshur County, and a slight distance east, extended the producing area this week when it tested 600 feet of oil in five minutes, proving some kind of producer. Tubing is now being run and a test will be made as soon as this is completed. Top of sand was cored at 3,692 feet, and total depth is 3,712 feet. This is one of the largest extensions made for some time in the field and proves up several hundred more acres to production. Other tests north of it will be interesting from the standpoint of possible extensions to the north, or markers limiting the pool in that direction. The rest of the producing areas may be considered defined, but southern Upshur County May continue to be extended for several miles farther north by producers unless one of the wells now drilling in this immediate area shows up water, or goes into the Georgetown without coring saturated sand.

Northern Limit to Lathrop

Joe Burnham's No. 1 Beck in the Augustine Survey, Upshur County, 3 miles northwest of Gladewater, may now be considered out of the picture as a producer, and may not be put down as a sure limit to the Lathrop Pool due to the Everett well getting water due north of Gladewater, and this test now coring at 3,798 feet without any encouraging showing of oil.

Hurlburt & Brown's No. 1 Mackey in the E. Y. Chambers Survey, Gregg County, approximately 1 mile north of production in the Lathrop Pool, was abandoned this week, limiting production on that side of the pool. The Pecan Gap chalk was topped at 2,376 feet, the base was logged at 2,936 feet, top of the Austin chalk was logged at 3,583 feet, and top of the Georgetown was encountered at 3,648 feet. Total depth of the test is 3,651 feet. This was an exceedingly interesting test, as it was an outpost marker, either extending production or limiting the pool, and has been closely watched for results.

The Texas Company's No. 1 Turner in the T. H. Smith Survey, northeast of the Joiner Pool, Rusk County, is another interesting test which has been closely watched for results during the past two weeks due to its strategic location. It is now drilling below 3,682 feet with nothing showing to encourage the thought that it may make a producer. It had some saturated sand from 3,598-3,602 feet, and the 6-inch casing was set at 3,585 feet preparatory to completing it, but this 4 feet of sand was not considered good for production and drilling was resumed as soon as the casing was set.

Alco Royalty Co.'s No. 1 King, on a 24-acre tract in the George A. Thomason Survey, western Gregg County, inside of the producing area, was completed this week making 155 bbls. the first hour through eleven-sixteenths-inch choke on tubing, showing 365 pounds tubing pressure, 39 pounds pressure on the separator and 440 pounds closed pressure. This well is approximately 2½ miles southeast of Gladewater, and is a considerable distance from the nearest producer, therefore being of interest to those who own leases and royalties on offset acreage.

Wells on the Pump

There are at present 33 wells pumping in the Joiner Pool, Rusk County, with 24 others dead that have quit flowing and having no pumping equipment on the lease ready to be rigged up on the wells. Thirteen others are "dead," but pumping equipment is being installed on them. Twenty wells are flowing with some agitation, and 14 are having pumping equipment rigged up, but are still off production at the present time. This makes a total of 104 producers in the

(Continued on Page 114)

EAST CENTRAL TEXAS WILDCATS

Week Ending July 6

Company, well, farm name, section and block—	Remarks:
ANDERSON COUNTY	
Riango Oil Co.'s No. 1 J. Lynn, 1,400 ft. from NE line and 7,425 ft. from E line of survey, R. Brown Sur.	Drlg. 2,040 ft. in hard lime rock formation.
H. B. McConnell et al's No. 1 N. B. Watson, 500 ft. from W line and 4,850 ft. from N of S line of survey in S half of 129-ac. tract, M. Ma'n Sur.	Derrick.
ANGELINA COUNTY	
R. O. Moore's No. 1 Abney Estate, 50 ft. N of Blk. No. 6, immediately out of city limits of Lufkin	T. D. 1,350 ft.; set 6⅝-in. csg.; bailed dry.
Pollick Oil Co.'s No. 1 Sessions, 1,250 ft. from N and 1,250 ft. from E line of Jesus De La Garza Sur.	Shut down 3,600 ft.
BOWIE COUNTY	
Tom Bell's No. 1 Merritt, 1,225 ft. from N and 875 ft. from E line of survey, T. S. McKinney Sur.	Coring 2,851 ft.
Devore and Midfield's No. 1 Roy B. Cooper, 250 ft. from N and 250 ft. from E line of Cooper 115-ac. tract, W. M. Ward Sur.	Shut down 2,885 ft.
Parkering-Jones et al's No. 1 W. W. Whybark, 300 ft. from S and W of SW cor. of J. A. Dyer Sur.	Derrick.
Lee Timberlake et al's No. 2 Julius N. Tidwell, 655 ft. from E and 2,510 ft. from S of survey in L. M. Rice Sur.	Salt water on drill stem test; shut down 3,000 ft.
CAMP COUNTY	
W. E. Duke et al's No. 1 L. B. McCaslen, 3 miles NW of Lafayette, Mary Hays Sur.	Drlg. 2,875 ft.
Monitor Oil Co.'s No. 1 E. A. King, 150 ft. E of railroad and 150 ft. N of S line of E. A. King 318-ac. tract, E. A. Peek Sur.	Drlg. 3,280 ft.
CHEROKEE COUNTY	
Ben Banner's No. 1 J. Williams Estate, 150 ft. S and 300 ft. W of SE cor. of the N. Hogg heirs and in the J. L. Hogg heirs Sur.	Shut down 4,190 ft.
Denman et al's No. 1 Mrs. Renfroe, 330 ft. N of S line and 330 ft. E of W line of farm, Uriah Moore Sur.	Shut down.
Helen-Clare Oil Co.'s No. 1 Mrs. M. P. Perkins, 1,800 ft. from N and 450 ft. from W of survey, Thomas Stafford Sur.	Rig up.
William A. Stone's No. 1 Blount Decker, 900 ft. E of E line of S. Selman Sur. and 1,200 ft. S of N line of E. M. Decker 406-ac. tract in George Ruddle Sur.	Fishing 5,406 ft.
Walton Oil Co.'s No. 1 E. Singletary, 250 ft. W and 150 ft. N of NE cor. of M. Lacey Sur. and in Walters Sur. on Singletary 84-ac. tract	T. D. 2,960 ft.; shut down.
DALLAS COUNTY	
Paris' No. 1 Wilkinson, 2,787 ft. from NW and 3,241 ft. from SW of John P. Anderson Sur.	T. D. 870 ft.; shut down.
DELTA COUNTY	
Delta Development Co.'s No. 2 Mallie Ablowich, 300 ft. S of No. 1 Cooper, Townsite Sur.	Reaming to bottom at 3,128 ft.
D. S. Hood's No. 1 J. J. Balser, 185 ft. from S and 530 ft. W of Balser 40-ac. tract in SE cor. T. B. Laddin Sur.	Rig up.
ELLIS COUNTY	
E. M. Roger's No. 1 John Lee Winn, 1,650 ft. from E and 510 ft. from S of Orland	Shut down 1,360 ft.; drill stem in hole.
FRANKLIN COUNTY	
George L. Pace and L. B. Pruitt's No. 1 C. E. Cowan, 150 ft. out of NE cor. of 92-ac. tract and survey, Lipscomb Sur.	Drlg. 3,500 ft.

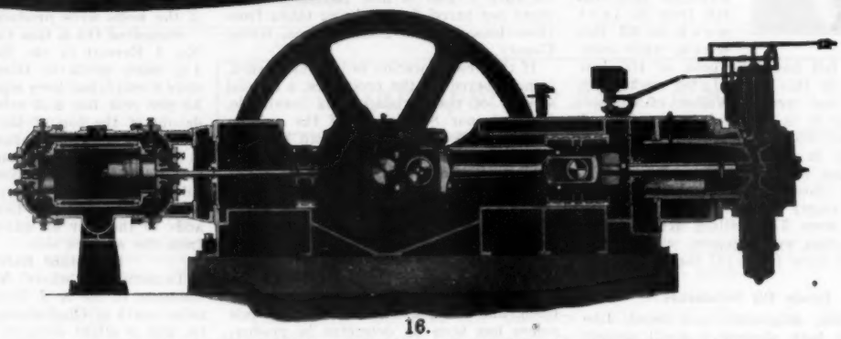
(Continued on Page 100)

TRANSIT

17x24" Twin, Four-Cycle 170 H.P. SINGLE ACTING

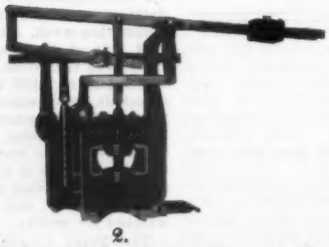
1.

Mr. S. B. Daugherty, the designer, is well known to many natural gas men as a designer and technical gas man.



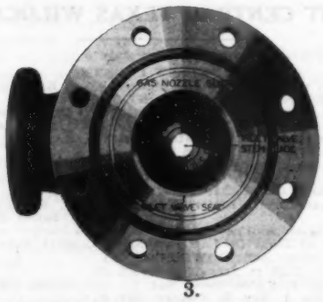
16.

Longitudinal Section. TRANSIT Model 26 Gas Engine Compressor, (above).



2.

The Regulating Valves proportion the mixture of gas and air, and control the amount of air and gas admitted to each cylinder.

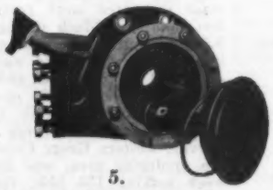


3.

Inlet Valve, gas nozzle arrangement. The vacuum produced on the intake stroke draws in the air over and around the gas nozzles projecting into the air stream, and the correct amount of gas as metered by the regulating valve, is drawn into the air stream through the long narrow slots of the gas nozzles in the form of thin ribbons of gas.

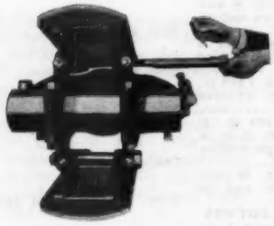
4.

A Tie Bolt (above), is provided through each frame at each main bearing. The weakening effect of the gap in the frame for the main bearing is entirely eliminated by this tie bolt.



5.

Exhaust Valve Casing, Upper Part (above). Note entrance of cooling water at pencil point, removable flanged sleeve with rubber gaskets, and slot for elimination of air pocket.



6.

Eccentric Bolt for adjusting crosshead shoes, (left). Crosshead shoes are of the hinged type, adjustable for wear by means of eccentric bolts passing through lugs on the crosshead.

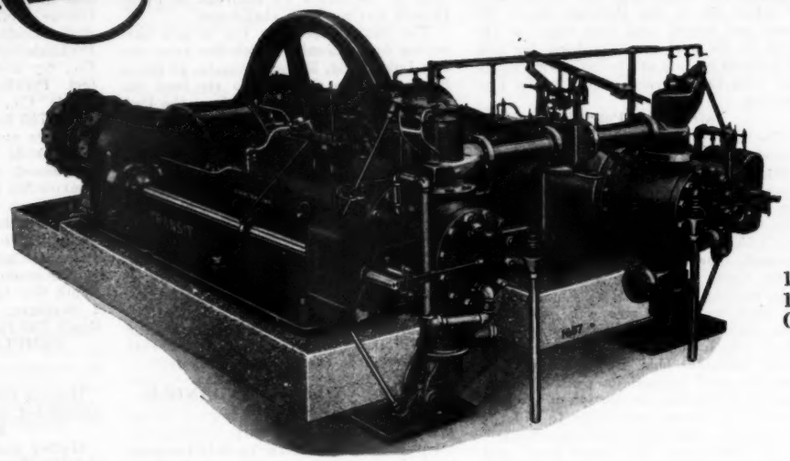
8.

The short, stubby crankshaft, (below), is 11½" in diameter. Distance between center of main bearing to center of crank pin is very short.

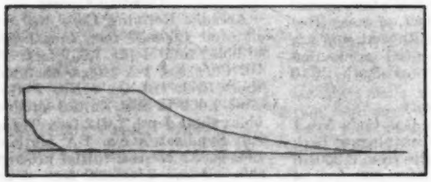
7.

Valve Mechanism, cover removed (left). Cam, cam levers and rollers are completely enclosed in a box with detachable cover, bolted to the outside of each cylinder casting. A single cam actuates the intake valve, exhaust valve and air starting valve. Broad faced cam and cam rollers insure long, accurate life to these important parts.

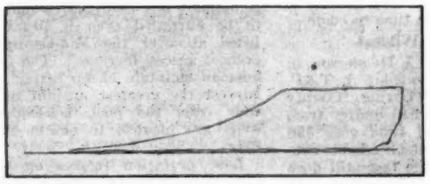
Gas Engine Compressor



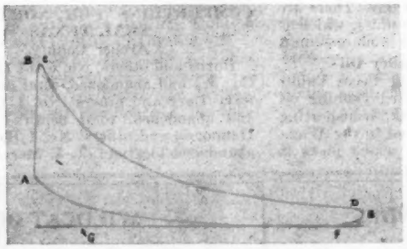
17.
17x24' Twin, Four Cycle 170 h. p. Single Acting Gas Engine Compressor.



9-10
Cards from inner and outer ends of second stage compressor cylinder.
These cards are notable in that they show no unseating pressure. This is due to very light valve plates and narrow seats.



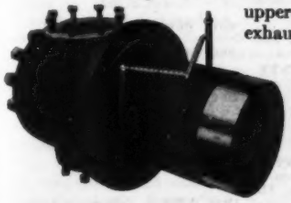
12.
Inlet Valve Casing, (left). Illustrating air intake and gas intake into inlet valve. Mixture occurs in inlet valve, just 1¾" ahead of inlet valve seat.



11.
Unretouched Indicator Diagram, (left), from left-hand cylinder of this engine. Diagram shows a nearly perfect mixture.

15.
Main Bearing Assembly (below), removed from frame to show construction.

14.
Air Starting and Check Valve Assembly, (left). The same cam that operates the inlet and exhaust valves is also used to operate the air starting valve. No chatter.



13.
Each power cylinder, is a separate casting with its inlet valve on the upper side and the exhaust valve on the lower side. Bolting strains are not communicated to the cylinder bore.

BEAUMONT, TEXAS
E. L. Wilson Hardware Company
SALT LAKE CITY, UTAH
F. C. Richmond Machinery Co.
TULSA and MID-CONTINENT FIELD
Frick-Reid Supply Corporation

NATIONAL TRANSIT
PUMP & MACHINE CO.
OIL CITY, PA.

PHOENIX, ARIZ.
Pratt-Gilbert Co.
LOS ANGELES
Republic Supply Company of California
ST. LOUIS, MO.
Reeves & Skinner Machinery Co.

GAS ENGINES
GAS ENGINE GAS COMPRESSORS
TOOLS

NEW YORK PHILADELPHIA CLEVELAND PITTSBURGH LOS ANGELES HOUSTON TULSA NEW ORLEANS

Loving County Wildcat Is Interesting

Oil Coming From Delaware Sand Is High Gravity. Well to Be Given Another Shot. Yates Potential Shows Decrease

By L. E. Bredberg
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., July 6.—J. D. Wesner, who is owner of the No. 1 Nicks test, north of Eldorado in Schleicher County, which has been shut down for the past three weeks while a potential sale of a three-quarters interest in the test and acreage was pending, is now resuming operations on the test since that deal is definitely off. The test will be swabbed and drilled deeper from its present total depth of 4,006 feet, where it has been standing shut down in brown sandy lime. Some 200 acres were sold around the test for $50 an acre by Mr. Wesner; the main deal involved the sale of a part interest in the test and some 3,500 acres around it.

This test has swabbed considerable more oil than any other test in the county, and has renewed interest in the county, still having a chance to produce from pay formations which produced good showings in Phillips Petroleum Co. and Interstate's No. 1 Whitten, several miles northwest of the Nicks test, if the present pay formation does not produce in commercial quantities. Oil found at this depth or below 4,000 feet could not be produced at a profit under present conditions, consequently the test has not attracted the attention it otherwise would. Producers at such depth cannot compete with the East Texas district producers at this time, or for some time to come.

Loving County Wildcat

Lewis & Siagel's No. 1 Henderson, in Section 1, Block 57, Township 1, T.&P. Survey, northwestern Loving County wildcat, was shot with 240 quarts from 3,089 to 3,150 feet and fluid rose 550 feet in 12 hours, of which about one-fourth was water, but the test still does not show as a commercial producer. It will be plugged back again after it is cleaned out and will receive another shot. Total depth is 3,182 feet and it was formerly plugged back to 3,120 feet before shooting.

This is an exceptionally interesting test due to production in this county coming from the Delaware sand, and the oil being high gravity and sweet. The Wheat Pool, southern Loving County, has never been prorated, and the oil has always brought a higher price than other oils in West Texas, except oil from the deep producers in the Big Lake Pool, but recently the crude was cut to the level of other oils in the Permian Basin, 25 cents per barrel, and now some of the wells in the pool are shut down for lack of demand by one of the refineries which has been taking part of the pool's production.

Yates Pool Potential

The umpire's proration sheet for the period from July 1 to July 31 shows the potential production of the Yates Pool, Pecos County, to be 2,427,900 bbls. for the 12-hour period, a decrease of 325,818 bbls. from the figures given June 1, which was 2,753,718 bbls. Two wells have been dropped, there now being 401 producing in the field. Eighty-one wells are shown to be making water. On a 24-hour gauge the field would register only 4,855,800 bbls. according to the 12-hour gauge taken, which shows the potential to be under 5,000,000 bbls. for the first time since the pool reached its peak of development. Curtailing production of the pool is not being done principally to aid the oil industry and keep down production, but to keep down the water head, and result in a greater ultimate yield. This is possibly one field that would continue to be curtailed even if proration was lifted all over the Mid-Continent, and even if prices increased. The companies hope to maintain cheap lifting costs and harvest the greatest amount of oil possible from the pool, consequently the wells are pinched to obtain these benefits.

Last proration figures on the Penn Pool, Ector County, show a daily potential of the pool of 25,370 bbls. and nominations of 5.855 bbls. per day. There are 77 wells producing on 54 units, which is a decrease of three wells and one unit.

Running Pecos Valley Oil

The new line serving the Pecos Valley Pool, Pecos County, started running oil the fore part of this week, transporting it via the Grand Falls Pool to the Wickett Pipe Line Co.'s line, which picks it up and runs it on to the Wickett Refining Co. at Wickett. This line is the only one now running oil from the Shipley Pool, a former carrier to a loading rack on the Santa Fe Railroad in Pecos County having been abandoned.

The Texas Pipe Line Co. is now surveying for a 27-mile 6-inch line from the Big Lake Field, Reagan County, to Iraan Station, Pecos County, to tie into the company's main trunk line from the Permian Basin to Port Arthur. This line will transport oil from the deep wells of the Big Lake Oil Co. to the Republic Oil Refining Co.'s plant at Houston, the pipe line company having a contract to transport a minimum of 5,000 bbls. per day and a maximum of slightly over 25,000 bbls. per day for 32½ cents carrying charges per barrel. The Big Lake Oil Co. owns an interest in the Republic plant at Houston and has been shipping oil from the pool to this refinery by tank car. The new contract with the Texas Pipe Line Co. will effect a saving of about 20 cents per barrel for the former company.

COMPLETIONS IN PANHANDLE DISTRICT

Carson County

Gulf Production Co.'s No. 1-D Burnett, total depth 3,237 feet, plugged back to 3,171 feet, top gas sand 2,975 feet, initial production 19,000,000 feet of gas. Red River Gas Co.'s No. 1-A Burnett, top gas sand 2,283-2,585 feet, initial production 8,000,000 feet of gas, total depth 2,710 feet.

Moore County

Cloud and Dana Oil & Gas Co.'s No. 1 Utey, total depth 3,526 feet, plugged back to 3,292 feet, shot 40 quarts from 3,250-70 feet, initial production 3,000,000 feet of gas.

COMPLETIONS FOR NORTH CENTRAL TEXAS

Archer County

Burns and others' No. 5 Oil Investment Co., dry and abandoned, total depth 1,450 feet. Darr and others' No. 1 Lyles, dry and abandoned, total depth 1,703 feet. Hammond and others' No. 1 Hutcherson, abandoned location. J. J. Macon's No. 1 White, dry and abandoned, total depth 1,431 feet.

Young County

J. D. Loofbourrow's No. 1 Boze, dry and abandoned, total depth 1,650 feet. George Mollenkoph's No. 1 Jeffery, dry and abandoned, total depth 1,016 feet. Peckham and Ard's No. 2 Belknap Cattle Co., dry and abandoned, total depth 722 feet. Peckham and Ard's No. 3 Belknap Cattle Co., dry and abandoned, total depth 715 feet. Powers and others' No. 1 Nall, dry and abandoned, total depth 742 feet. D. M. Ross' No. 1 Keith, dry and abandoned, total depth 780 feet. John Sharp's No. 1 Bagley, dry and abandoned, total depth 450 feet. Victor Swanson's No. 1 Moreland, dry and abandoned, total depth 713 feet. Willis and others' No. 5 Belknap Cattle Co., oil sand 645-57 feet, initial production on pump 15 bbls., total depth 657 feet. Willis and Terrell's No. 1 Stringer, dry and abandoned, total depth 705 feet.

COMPLETIONS IN RANGER DISTRICT

Brown County

Herring Oil Co.'s No. 1 Leach, dry and abandoned, total depth 660 feet.

Callahan County

Guffey and Perry's No. 1 George, dry and abandoned, total depth 778 feet.

Coleman County

Arcadia Refining Co.'s No. 8 Golson, oil sand 1,609-37 feet, initial production 40 bbls., total depth 1,637 feet. Big Lake Oil Co.'s No. 1-A Biggs, abandoned location. Brek Oil Co.'s No. 7 Golson, oil sand 1,602-12 feet, initial production 50 bbls., total depth 1,612 feet. Texas American Syndicate's No. 1-A Mathew, sandy lime 3,832-37 feet, initial production 400 bbls. oil and 3,000,000 feet of gas, total depth 3,837 feet.

Shackelford County

Worth Petroleum Co.'s No. 1 Jester, dry and abandoned, total depth 1,229 feet.

Palo Pinto County

Hood Oil & Gas Co.'s No. 1 Robbins, dry and abandoned, total depth 1,220 feet. Britton and Gordon's No. 3 Strawn Cattle Co., gas sand 3,017-44 feet, shot 110 quarts 3,015-45 feet, initial production

(Continued on Page 98)

WILDCAT OPERATIONS IN TEXAS PANHANDLE

Week Ending July 6

CARSON COUNTY

Company, well, farm name, section and block—	Remarks:
Deep Lake Oil Co.'s No. 1 Keys, NE cor. SW, Sec. 1, Blk. 4, I.&G.N. Sur.	S.G. 2,230 ft; 12,000,000 ft. gas; drlg. 2,785 ft.
El Paso-Amarillo O. & G. Co.'s No. 1 Chapman, 594 ft. S, 1,458 ft. E, Sec. 7, Blk. 3, A.B.&M. Sur.	Rig.
Interstate Prod. Co.'s No. 1 Selber, C NW, Sec. 10, Blk. 7, H.&G.N. Sur.	Standardizing 2,314 ft.
The Texas Co.'s No. 1 Crutchfield, 1,320 ft. S, 1,331 ft. E, Sec. 39, Blk. 4, I.&G.N. Sur.	Bldg. rig.

CHILDRESS COUNTY

C. L. Sloan et al's No. 1 B. P. Smith, Sec. 49, F. P. Knott lands	T.D. 5,000 ft.

COLLINGSWORTH COUNTY

Dixon et al's No. 1 Bell, 330 ft. N, 1,320 ft. W, Sec. 102, Blk. 21, H.&G.N. Sur.	Top pay 2,495 ft; 300 ft. oil in hole; S.D. 2,503 ft.

COTTLE COUNTY

Darby Oil Co. and Merry Bros. & Perrin's No. 1 Richards, 330 ft. NE, Sec. 13, B.S.&F. Sur.	Drlg. 4,810 ft.

GRAY COUNTY

Anderson et al's No. 2 Vollmert, 330 ft. N and W, SW, Sec. 140, Blk. 3, I.&G.N. Sur.	Rig.
Back & Barber's No. 1 Back, 330 ft. S and E, SW, Sec. 45, Blk. 25, H.&G.N. Sur.	Location.
Boyles et al's No. 1 Colebank-Morse, 330 ft. NE, Sec. 65, Blk. 25, H.&G.N. Sur.	Spudded and S.D.
Brown et al's No. 1 Duncan, 330 ft. S and E, NW, Sec. 93, Blk. 3, I.&G.N. Sur.	S.D. 950 ft; trying to pull 8-in. csg.
Cree Hoover & Traham's No. 1 Delmar, 330 ft. S line, 330 ft. W line, NW, Sec. 105, Blk. 3, I.&G.N. Sur.	T.D. 3,264 ft; T.P. 3,228-55 ft; C. O. after 45-qt. shot; estimated 6 bbls. daily.
Danciger O. & R. Co.'s No. 1 Barrett, NW cor. S½ NE, Sec. 128, Blk. 3, I.&G.N. Sur.	T.D. 3,365 ft; plugged back 3,325 ft; top pay 3,175 ft; swbd. 60 bbls; to shoot.
Danciger O. & R. Co.'s No. 1-B Barrett, SW cor. N½ NE, Sec. 128, Blk. 3, I.&G.N. Sur.	T.D. 3,280 ft; top pay 3,221 ft; swbng. 7 bbls. per hr.

(Continued on Page 100)

WILDCAT OPERATIONS IN WEST TEXAS

Week Ended July 6

ANDREWS COUNTY

Company, well, farm name, section and block—	Remarks—
Deep Rock Oil Co. et al's No. 1 Kuykendall, 2,310 ft. from N and E of SW cor. Sec. 34, School Blk. A-46	Shut down; total depth 4,648 ft.; plugged back to 4,565 ft.

BREWSTER COUNTY

Brewster Oil Co.'s No. 1 fee, 2,640 ft. S [illegible] 2,598 ft. E of NW cor. Sec. 45, Blk. G-15, G.C.&S.F. Sur.	Shut down 1,935 ft.
E. L. Chapman's No. 1 Skinner, C SW SE Sec. 100, Blk. 1, G.C.&S.F. Sur.	Shut down 1,302 ft.
Trans-Pecos Oil & Gas Co.'s No. 1 Jones, 930 ft. from N and 2,500 ft. from E of Sec. 18, Blk. G-15, G.C.& S. F. Sur.	Shut down 2,830 ft.
Van McPhail's No. 1 McIntyre, SE cor. Sec. 59, Blk. 352, 7 miles south of Alpine	Shut down 1,760 ft.

CONCHO COUNTY

Beesley et al's No. 1 Waring Estate, 400 ft. from N and E Sec. 163, T.&N.O. Sur.	Shut down 247 ft.
Betts & Dennis' No. 1 H. E. Woods, 710 ft. from E and 150 ft. from S Sec. 3, H.E.&W.T. Sur.	Shut down 80 ft.
Turner et al's No. 1 Borsig, 150 ft. from S of NE cor. G. Emmig Sur. 130, 6 miles W of Paint Rock	Shut down 1,850 ft.

CRANE COUNTY

E. H. Sides et al's No. 1 B. P. Nolen, 150 ft. from S and 150 ft. from W of N 160 acres, Sec. 8, Blk. 31, H.&T.C. Sur.	Drlg. 1,950 ft.; show oil 1,920 ft.

CROCKETT COUNTY

Doleman & Moore's No. 1 Perner, 2,135 ft. from N and 1,485 ft. from E of Sec. 36, Blk. 2, I.&G.N. Sur.	Spudded and shut down.
Kornrumpf et al's No. 1 Garren, 330 ft. S and W sec. 16, Blk. 79, Public School Land	Shut down 1,330 ft.

DAWSON COUNTY

Albaugh et al's No. 1 Robinson, C NW Sec. 46, Blk. M, E.L.&R.R. Sur.	Spudded 30 ft. and shut down.

ECTOR COUNTY

H. F. Wurts' No. 1 E. A. Ibbetson et al, 330 ft. from N and E lines of NW Sec. 16, Blk. 46, Twp. 3s, G.M. M.Br.&A. Sur.	Shut down 3,375 ft.

EL PASO COUNTY

Tri-State Oil Co.'s No. 1 Bobadella, 1,325 ft. from S and E lines Sur. 254, S.F. No. 7,247	Show gas 795 ft.; drlg. 1,363 ft.

(Continued on Page 99)

Simplify Gasoline Treating Problems

Crosbie & Moran, Inc., Replaces Use of Bleaching Powder With Concentrated Calcium Hypochlorite to Reduce Costs

By W. T. Ziegenhain

Crosbie & Moran, Inc., has simplified the treating problems at its natural gasoline plants in the Seminole, Okla., Field by the use of a concentrated, soluble calcium hypochlorite in preference to the ordinary bleaching powder previously used. The new chemical is known commercially as HTH. Its available chlorine concentration is approximately double that of high-grade bleaching powder and it is also a stable material, undergoing little or no decomposition, even during the hot summer months.

The unit cost of the new chemical is slightly greater than either liquid chlorine or bleach but this may be more than equalized by the lower maintenance cost on the equipment, by the fact it requires less labor to handle and that it minimizes the time consumed in shutting down the treating system for cleaning or replacing corroded parts.

The simplicity of a typical treating system, when using HTH is emphasized in the accompanying pictures. One of these shows the treating equipment at the Pearson gasoline plant and the other at the Konawa plant of Crosbie & Moran, Inc., both of these being located in the Greater Seminole area.

The gasoline is treated similarly in both plants, the only point of difference being in the unit consumption of the chemical which is determined by the relative sourness of the two gasolines processed. There is no need for a preliminary caustic wash as the gas contains no appreciable quantity of hydrogen sulphide.

Preliminary Caustic Wash

In those fields where the gas does contain a high percentage of hydrogen sulphide or the gasoline to be treated contains a relatively high percentage of mercaptans, at least one preliminary caustic wash is needed and in some cases multiple caustic washes have been found advisable. This, however, is a separate problem. In a similar manner, natural gasoline manufacturers have to carry on experiments at each plant to determine the detailed methods of handling that particular problem.

Without attempting to outline a procedure that would be applicable at all plants, the general procedure will be described at the Crosbie & Moran plants in which HTH has replaced bleaching powder.

The routine treating procedure simply resolves itself into one of withdrawing the HTH solution from a small, open supply tank, and pumping it through the orifice mixer where it contacts the raw gasoline. The mixture drops into the treating tank, where it separates and the solution is continuously withdrawn off the bottom to be returned to the supply tank. About every hour the operator adds the required amount of HTH to maintain the strength of the treating solution. Each hour the overhead stream of gasoline is tested in the laboratory with doctor solution to determine whether it is running sweet as a check on the operator.

The operator is soon able to judge what amount to add and is able to correlate the slowly fluctuating volume of natural gasoline being treated with the amount of HTH to be added. The dry, white powder goes into solution readily and he simply dumps the required amount into the supply tank.

The return line from the treating tank has its outlet below the surface of the solution in the supply tank and there is sufficient turbulence to cause the powder to be readily dissolved and also to effect a uniform strength in the solution. The quantity of solution in the system at all times is small and for this reason the HTH solution is brought back to the required concentration within a short interval of time. Only approximately 1,000 gallons of solution is in the system at the Pearson plant and about 80 per cent of this is in the treating tank, the balance being in the supply tank and lines.

Routine Operation

The average quantity of raw gasoline treated daily at the Pearson plant is 10,000 gallons, consuming about 45 pounds of HTH equivalent to 4½ pounds per 1,000 gallons of gasoline treated. This compares with 14 pounds per 1,000 gallons when using bleaching powder.

In the Konawa plant the same general procedure is observed, the solution being made up in the supply tank, but it is interesting to note that a horizontal type of settling tank is used. The picture of the Konawa plant also includes the old aerating equipment which houses the supply tank.

Here the solution is drawn out of the supply tank and is pumped through the orifice mixers shown in the picture ahead of the horizontal settling tank. This tank is separated into two equal compartments by a vertical partition. As the raw gasoline and the HTH solution are pumped through the mixer, they enter the first compartment. The solution drops out and the treated gasoline collects in the upper half of the compartment.

The bulk of the solution drops out readily and is withdrawn from the bottom and goes back to the supply tank. As a precautionary measure in removing any remaining solution the gasoline is led out of the far end at the top of the first compartment through a 2-inch line and into the bottom of the second compartment. Any traces of the solution have a chance to settle here and any solution that collects is periodically drawn off.

A float control automatically regulates the gasoline and solution entering the system so as to maintain the division point between the gasoline and the solution about midway up in the first compartment.

Horizontal Settling Tank

The advantage of the horizontal separator lies principally in its greater capacity per unit of volume. In the ordinary vertical settling tank, the flow of the gasoline is upward whereas the solution tends to settle out in the opposite direction. Thus the settling of the solution is retarded in proportion to the velocity of the upward flow of gasoline and the capacity of the unit is correspondingly decreased.

In the case of the other type of settling tank, the horizontal flow of the gasoline does not interfere with the downward fall of the solution droplets. The argument generally advanced against the use of the horizontal settling tank is that the solution and the gasoline require a prolonged time of contact and there is no advantage in causing a quick separation.

There is sufficient intimacy of contact in the orifice mixers used here, and the first compartment of the separator is sufficiently large, to allow ample time of contacting, while a relatively high throughput is maintained.

The shell of the horizontal treating tank is 20 feet long and 6 feet in diameter. The average throughput is 8,000 gallons daily, however, 25,000 gallons per day could be treated. This plant is treating 4,500 gallons per pound of H.T.H. against 1,500 gallons per pound for bleaching powder.

Design of Orifice Plates

The orifice mixer used in both plants was designed and assembled by the Crosbie and Moran engineers. It consists of the usual series of plates bolted between flanged nipples but the arrangement of the individual plates is interesting. The holes in each plate are formed by cutting the metal to form a V. The flap is bent to cause a whirling motion as the liquid is pumped through. Alternating plates have these flaps bent in opposite directions, causing the gasoline and solution to first whirl in one direction and then in the opposite direction, providing a very intimate contact throughout the length of the mixing column.

Bleach Causes Cleaning Often

The orifice mixers caked up badly when using bleaching powder and had to be cleaned every two to three months. By that time the holes in the plates were generally reduced to less than one-fourth of their original size by the accumulation of a white sludge. These plates have not been cleaned since HTH replaced bleaching powder in October of last year. In a similar manner, no other part of the system has been cleaned, the small accumulation of sludge in the supply tank being negligible within that time.

It was also necessary to replace the linings and the rods on the pumps used to circulate the solution about every six weeks or two months when bleaching powder was used. No replacements have been made on the pumps, except packing, for the past eight months and this item has represented an appreciable saving.

Another saving pointed out by the operators in favor of HTH is its slow rate of deterioration in storage compared to bleach. At 72° F. there is only about 2 per cent drop in the available chlorine content over a six months' time while bleaching powder has been known to lose all of its available chlorine in an even shorter period of time.

Chemical Analyses

For ready comparison, a typical chemical analysis is shown for HTH and also a high grade bleaching powder. This table clearly shows the cause for the greater deposition of sludge when using the bleach than when using the new chemical.

The following are the laboratory analyses of these two chemicals:

COMPARATIVE ANALYSES OF BLEACHING POWDER AND HTH-TECHNICAL—(CALCIUM HYPOCHLORITE)

	HTH technical per cent	High grade bleaching powder per cent
Available chlorine	63.4	36.0
Calcium chloride	1 0	28 5
Calcium hydroxide	3.5	13.0
Inert and insoluble matter, including calcium carbonate	.9	6.5
Sodium chloride	29.2	....
Water	2 0	16 0

Choice of Method

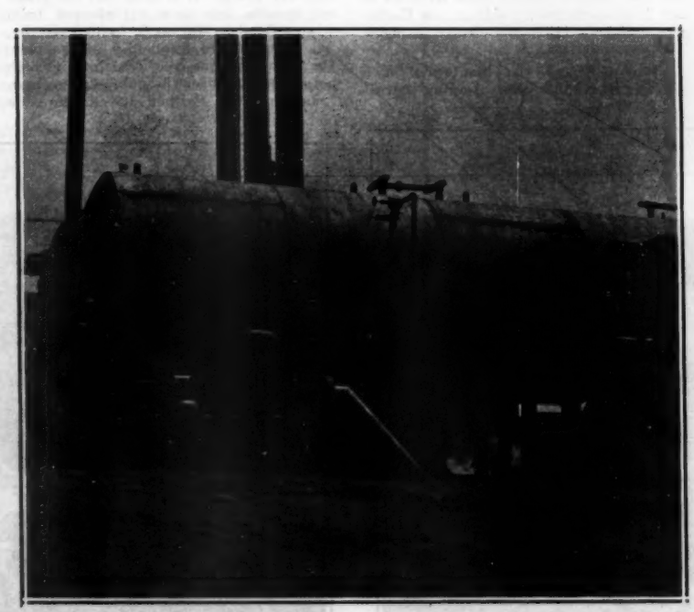
In the past, those natural gasoline manufacturers using hypochlorite have had a choice between buying the liquid chlorine and caustic to make their own solution or buying bleaching powder as discussed here. With the introduction of HTH, a third source of hypochlorite is made available.

The majority of the plants in the Mid-Continent use one of these sources of hypochlorite in treating their gasoline. The particular one to use depends upon the capacity of the plant or more directly, upon the amount of chlorine consumed. There is a very apparent advantage in the use of HTH in meeting the needs of the many natural gasoline plants now employing bleaching powder, whose problems are similar to those of Crosbie and Moran, Inc.

Other Results

Records of performance over long periods of time have demonstrated that available chlorine in the form of HTH has a particularly high treating efficiency. Comparative figures on the same gasoline treated with HTH and bleaching powder show that 1 pound of available chlorine as HTH will sweeten as much as 1,156.6 gallons of gasoline whereas 1 pound of available chlorine as bleaching

(Continued on Page 115)



Hypochlorite treating system in the Konawa, Okla., natural gasoline plant of Crosbie & Moran, Inc. At the extreme left is shown the orifice mixer and in the background the horizontal, two-compartment settling tank. To the left, and only partly showing, is the supply tank. With the pumps shown in the foreground, the entire treating system is included in the picture, emphasizing its simplicity and compactness.

Pipe Line to Monterey Now in Operation

Problems Encountered Somewhat Like Those Presented by Coalinga Field in 1902, When Technical Information Was Limited

Receipt in Monterey, Calif., of the first batch of crude from Kettleman Hills marked the solution of a problem somewhat similar to that presented by the Coalinga Field back in 1902, when technical knowledge of pipe line transportation was limited. Because of the inadequacy of existing pipe lines and the dearth of tank cars in that day some other means of getting the crude from Coalinga to seaboard had to be found. The Associated Oil Co. Record tells interestingly the story of the Coalinga-to-Monterey line and of the still greater achievement of getting Kettleman Hills production to the coast.

Whether the extremely low gravity crude produced at Coalinga could be pumped to the coast at Monterey was a subject of much controversy. Mountains and cold weather presented difficulties. However, William Matson of the Matson Navigation Co. believed it could be done and aided by William Crocker, George C. Cameron, John A. Buck and N. B. Irwin he formed the National Oil & Transportation Co., July 10, 1902, for the purpose of constructing a screw joint pipe line from Coalinga to Monterey.

Two years later, the Coalinga Oil & Transportation Co. acquired all rights and properties of the National Oil & Transportation Co., completing the pipe line in October, 1904.

The first crude was started through the line at Coalinga October 19, 1904, and it reached Monterey, 100 miles away, 10 days later. In 1905 the pipe line was asquired by the Associated Oil Co. By construction of additional pumping stations at various later periods, until the number totaled 17, the capacity of the line was increased from its initial 5,000 bbls. of 23.0 gravity to 15,000 bbls. of 15.0 gravity oil daily.

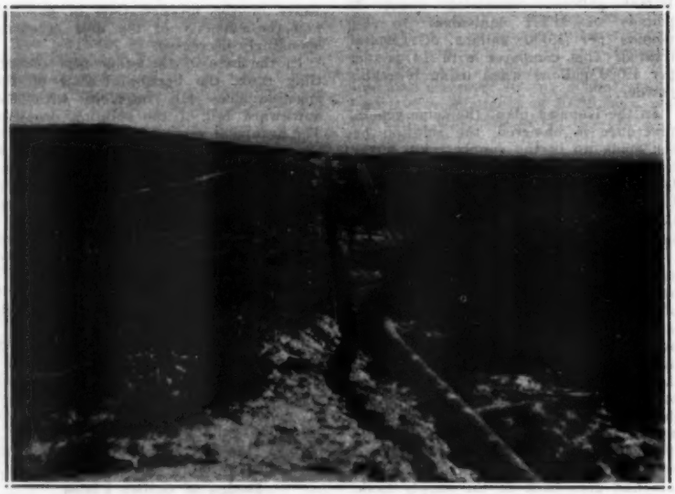
With the development of Kettleman Hills and resultant production of high gravity crude by the Associated Oil Co. from that field, the problem of economical transportation of the volatile crude presented itself. The company's pipe line running up the San Joaquin Valley to the refinery at Avon was needed to care for the transportation of the heavy crude produced by its other mid-state fields. Further, it had been established by experiences in other parts of the country that in pipe line transportation of high-gravity crude resembling gasoline, it is necessary to use a welded line to prevent leakage.

Several questions then arose concerning the Coalinga-Monterey line, viz., could the old line be cleaned out sufficiently well to carry volatile crudes? Was the old line in such condition that it would pay to convert it to use carrying light crudes or would it be more economical to build a complete new line?

Investigations were made by company engineers and after experiments it was found that the line could be washed clean and so it was given an internal bath. Further investigation disclosed that the condition of the line, which had been buried in the ground for 28 years, was satisfactory.

So early last March work was started on reconditioning 100 miles of the old line and construction of some 60 miles of new line south from Coalinga via Kettleman and Lost Hills to Belridge, using 6-inch seamless steel pipe.

From Coalinga the line runs in a northwesterly direction, leaping across streams, washes and canyons, by means of suspension bridges, and then burying itself in the mountains which form Priest Valley it crosses the hump at a height of 2,568 feet. From the high point the line plunges down the other side, following Lewis Creek, which is hurdled 22 times, and climbs up again, winding its way through the Topo Rancho, an old Spanish grant, extensive in area and dating back to the earliest California history. A fact of interest is that the line traversing the rolling hills could still be followed after 28 years by faint marks showing the course of the trench.



Section of line near Monterey successfully tested and ready to be set in trench and backfilled.

Joining the coast highway at Metz, the pipe line traverses about 40 miles of the level fertile Salinas Valley. Seven miles west of Salinas the line crosses the Salinas River on the new concrete state highway bridge. It is here that the greatest trouble has been experienced from winter floods. Station 8, located nearby, has been flooded frequently in the past, the water at one time reaching a high point of 6 feet over the pump-house floor.

Leaving the Salinas River, the line goes almost due west, climbing over a series of hills and sand dunes between Salinas and the coast, traversing the United States military reservation and the Presidio of Monterey, coming to a halt right on the shore of the Pacific at the Monterey Marine Terminal where the production is sent through the first submarine pipe line built on the Pacific Coast to the Associated's tankers anchored offshore.

Construction crews started at several points simultaneously by Hutchinson & Co. of Oakland were so organized that their operations followed each other in sequence. The first crew uncovered the old pipe by means of either ditching machines or plows, according to the character of the terrain. It was followed by a gang with a specially rigged tractor, which raised the pipe out of the trench and placed it on shores. Next came the gang who cleaned, scraped and inspected the pipe, marking out corroded, pitted and laminated pipe.

The cutters came next, burning out marked sections and all collars. A special type of rig was used for this work on which two acetylene torches were mounted. The machine was clamped around the pipe and by means of a handle and gear arrangement was slowly revolved around it. A complete revolution was sufficient for the collar to drop out leaving straight, clean, beveled edges ready for welding. This rig saved time and expense, especially when consideration is given to the fact that over 22,000 collars were cut out, not counting sections of pipe eliminated because of corrosion.

Following the cutters came the welders who joined up the lengths of pipe, after which the line was tested in sections about 8 miles in length by means of either water or air.

Pressure was gradually built up in the line until it reached a maximum of 800 pounds per square inch at which it was held for several days. Inspectors went over the line carefully and after the line was found absolutely sound the pressure was removed and the pipe lowered into the trench, backfilled and again subjected to pressure.

Favorable weather and good organization resulted in the completion of the work by the contractors in 75 days, two weeks ahead of schedule. The work was

(Continued on Page 71)

When the old pipe had been unearthed this specially rigged tractor was used to pull it out of the trench.

Some of the mountainous country that had to be crossed.

PERFORMANCE

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Pipe Line Construction News

MONTANA GAS SYSTEM NOW WELL UNDER WAY

DENVER, Colo., July 6.—Construction work on the Montana Power Co.'s natural gas system in Montana is well under way. The project of supplying natural gas to a number of Montana cities and towns and to the mines and smelters at Butte and Anaconda materialized to the point where construction could begin two months ago, when the Montana Power Co. acquired the natural gas holdings and pipe line interests of L. B. O'Neil and associates in the Cut Bank Field in Glacier County, northern Montana, and the Dry Creek-Livingston project of the Ohio Oil Co. in southern Montana.

The southern unit comprises a line from the Dry Creek Field in Carbon County through Bozeman to Livingston, a distance of 118 miles. Work on this unit was started the past spring by the Ohio Oil Co. and was taken over by the Montana Power Co. The Phoenix Utilities Co., a subsidiary of the Electric Bond & Share Co., has the contract for the construction of this part of the system. It will cost approximately $3,000,000 and is due for completion by August 1. The Bozeman distribution system, comprising 28 miles of mains, has been practically completed except for the installation of the regulators. This is a low-pressure unit.

The northern unit from the Cut Bank gas field to Anaconda is the largest of the two and will consist of 243 miles of 20-inch pipe. This line will serve Helena, Butte and a number of smaller towns. Winston Brothers of St. Paul and Minneapolis have the contract and work is in progress from both ends. This unit will cost around $12,000,000 and is due for completion about September 1. The A. O. Smith Corp. has the contract for the pipe for both units and also is doing the welding.

Louis B. O'Neil, vice president of Montana Power Co. in charge of oil and gas development, is supervising a drilling program in the Cut Bank Field, where 7 wells are now under way and 13 more probably will be drilling shortly. If Cut Bank fails to yield a sufficient reserve supply of gas, it is likely an arrangement will be made to obtain an additional supply in the Turner Valley Field in southern Alberta. The Dry Creek Field, which is operated by the Ohio Oil Co., has gas in the Frontier formation. A second well drilled through the gas sand to the Dakota series encountered oil at 5,514 feet. This well is on land owned by the Northern Pacific Railroad. The crude is unusually high grade and tests 52 gravity. The production is being shipped to the Utah Oil Refining Co. (Standard Oil Co. of Indiana) at Salt Lake City.

PROPOSE NEW GAS LINE FOR SAN FRANCISCO

LOS ANGELES, Calif., July 6.—Pacific Gas & Electric is acquiring rights of way for a new 26-inch natural gas line from Milpitas on the present line, extending 45 miles up the San Mateo peninsula to San Francisco, along a route west of the present line, according to announcement by Paul M. Downing, vice president and general manager.

The new line will probably be built some time this fall or by June 1, 1932, although not yet authorized by the directors. It will more than double the transmission facilities for Kettleman Hills natural gas into San Francisco. The present line is 20 inches, its daily maximum capacity 80,000,000 feet and it carries between 65,000,000 and 70,000,000 feet with storage capacity for 32,370,000 feet, or only 24 hours' supply at San Francisco.

COLUMBIA CLEANING OLEAN LINE FOR GAS

NEW YORK, July 6.—Columbia Gas & Electric Corp. is cleaning and putting into shape the former National Transit oil pipe line running from Olean and Binghamton, N. Y., to Garfield, N. J., preparatory to the transmission of natural gas. The line has a daily capacity of between 15,000,000 and 18,000,000 feet of natural gas, but it is believed the capacity of the line will be supplemented by looping as the pay load is built up.

Both the Public Service Corp. of New Jersey and the Niagara Hudson Power Corp. are planning the early purchase of natural gas from the New York and Pennsylvania fields, it is reported in financial circles here, with Columbia Gas & Electric Corp. mentioned as the supplier in both instances.

Engineers of the Niagara Hudson Power Corp. have been surveying the company's manufactured gas facilities for some time, with a view of utilizing natural gas from the Tioga area in the company's distribution, either as a supplement or enriching mixture for the manufactured product or for marketing in the natural state.

Public Service Corp., which controls the gas business in the larger centers in New Jersey through Public Service Electric & Gas Corp., is reported to have made a thorough survey of industrial consumers in some of the manufacturing centers in its territory, with a view to lining up natural gas contracts, and it is believed that distribution will get under way before the close of the year. In addition, the New Jersey company is expected to use the natural product blended in with its manufactured gas output for domestic consumption.

WHITE EAGLE CONTRACT LET FOR KANSAS LINE

The White Eagle Pipe Line Co. has let the contract for its 40-mile pipe line from Valley Center to the Canton Field of McPherson County to Knupp and Freddell, a Texas construction concern. It was specified that work was to be pushed for completion by August 15, if possible.

The pipe line will pick up production of the Magnolia Petroleum Corp., a subsidiary of the Standard Oil Co. of New York, and other production in the field. The capacity of the line will be approximately 11,000 bbls. a day when completed.

WEST TEXAS LINES

MIDLAND, Tex., July 6.—First oil has been run through the new Wadsworth-Messenger and others pipe line from Pecos Valley Field to the Shipley Field in Ward County. The Wickett refinery was scheduled to begin a 24-hour operating program this week.

Survey of the Texas Pipe Line Co. for a new 6-inch line from the Iraan pump station east of the Yates Field to the Big Lake Field has been finished. The Texas Company has contracted to run a minimum of 5,000 bbls. and a maximum of 25,000 bbls. daily through the 27-mile line.

MISSOURI VALLEY EXTENSION

The Missouri Valley Pipe Line Co. has announced it would receive bids on a 26-inch pipe line to loop its present line from McPherson County, Kansas, for a distance of 120 miles to the north. The company built the first line about a year ago which extends on north into Iowa and Nebraska. The construction work on the new line is expected to get under way in a few weeks.

GREAT LAKES GASOLINE EXTENSION COMPLETED

Great Lakes Pipe Line Co. has completed the 6-inch extension of its line from Des Moines to Chicago and preparations are now being made to "slug" this section of the carrier with gasoline. At the present time the company is running gasoline through its line from Barnsdall by way of Kansas City, as far as Des Moines. Work on the line's other branches which will extend from Des Moines to Minneapolis and St. Paul, to Council Bluffs and Omaha is progressing rapidly and these extensions should be ready for operation around the first of August. Extension from Chicago to Milwaukee should be finished at the same time.

The carrier, which is owned by the Barnsdall Corp., Continental Oil Co., Skelly Oil Co., Phillips Petroleum Co., Mid-Continent Petroleum Corp., and Pure Oil Co., will be the longest gasoline line in the world. The line which is being built of 4, 6 and 8-inch pipe will have a capacity of 30,000 bbls. daily, and with gathering lines to the various refineries and including extensions to various points of consumption will be 1,400 miles in length.

Cost of the line when fully completed will be upwards of $12,000,000. Distributing stations on the line are being built at intervals of about 60 miles. At these points gasoline will be drawn off and distributed by trucks and trailers to points within a radius of 50 miles on both sides of the line.

TO LAY 50-MILE LINE FROM EUREKA, KANSAS

A 50-mile pipe line is to be constructed from Eureka, Kans., to the gas fields of eastern Elk and Chautauqua Counties by the Mid-State Pipe Line Co., a new Kansas concern backed by Chicago interests. The trunk line will be 6-inch pipe and the gathering lines of varied diameter.

Attempts to find quality gas near Eureka have all failed, but the Elk and Chautauqua gassers produce a fuel of 900 to 1,500 B.t.u. and it is to obtain this gas that the pipe line is being laid. The cost will be approximately $100,000, it is said.

The gas will be sold to the Western Natural Gas Co., holder of the Eureka franchise and of other franchises in that vicinity. The Western company is a Salina concern, of which Nathan L. Jones is the head.

SURVEY 125-MILE LINE IN ERATH COUNTY, TEXAS

FORT WORTH, Tex., July 7.—Nat J. Harbin of Tulsa and associates of New York are surveying for 125 miles of 6-inch gas line which they contemplate laying at once to serve the city of Stephenville, Erath County, Texas. Gas will be taken from the X-Ray Field. The new company has a franchise in Stephenville. The Southwest Gas Co. is now serving the city. W. J. Harrison is directing the survey of the route.

FREDELL CO. COMPLETES TWO LINES; STARTS ONE

PALESTINE, Tex., July 7.—The Fredell Construction Co. will complete the Sinclair Texas 12-inch oil line from Longview to Teague, Tex., this week. This company will also complete 140 miles for Moody-Seagraves at Hugoton, Kans., next week and is starting the line for White Eagle Oil Co. this week at Wichita, Kans.

KANSAS PIPE LINE CO. NOW HAS 1,200 MILES

Organized shortly after the discovery of gas in McPherson County, Kansas, the Kansas Pipe Line & Gas Co. is operating approximately 1,200 miles of transmission lines in Kansas and Nebraska. This includes a 16-inch main line from Medicine Lodge, Barber County, in southern Kansas, to Grand Island, Neb., connecting with gas acreage owned by the company in six counties.

The first town serviced after the company was formed was Salina, in 1928. Soon the production of natural gas by an affiliated company, the McPherson Oil & Gas Development Co., increased and considerable gas acreage was acquired. Then began the building of transmission lines to reach additional markets.

The Kansas Pipe Line & Gas Co. is a subsidiary, operating the natural gas properties of the North American Light & Power Co.; in this group so operated are the Kansas Pipe Line & Gas Co., Western Gas Co., McPherson Gas Co., Kingman County Gas Co., Kansas Gas & Gasoline Co., and McPherson Oil & Gas Development Co.

Within the last year the company has erected two large compressor stations, one near Abilene, Kans., and one near Kingman, and has constructed over 500 miles of main lines in the State of Kansas. Distribution systems were built in 24 towns.

The company is now serving a population of 117,000 in the following towns: Abilene, Assaria, Axtell, Baileyville, Beattie, Belleville, Bison, Blue Rapids, Buhler, Canton, Chapman, Clay Center, Clifton, Clyde, Concordia, Cuba, Ellinwood, Enterprise, Frankfort, Galva, Garfield, Gorham, Great Bend, Gypsum, Hanover, Hoisington, Hope, Inman, Irving, Junction City, Kingman, Kinsley, LaCrosse, Larned, Lewis, Lindsborg, Loretto, Manhattan, Marysville, Marquette, McPherson, Medicine Lodge, Mentor, Morganville, Moundridge, Munden, Olmitz, Otis, Pretty Prairie, Russell, Salina, Seneca, St. George, St. Marys, Timken, Victoria, Walker, Wamego, Washington and Waterville.

The company is wholesaling gas in Hutchinson, Herrington and Hays.

The transmission lines of the Kansas Pipe Line & Gas Co. were constructed under the supervision of H. R. Maxon, consulting engineer, of Muncie, Ind. The executive office of the company is located at Topeka, Kans., under the direction of A. M. Patten, president, and L. W. Johnson, vice president, in charge of land and leases.

CANADIAN GAS EXTENSION

CHATHAM, Ontario, July 6.—Shareholders of Union Natural Gas Co. of Canada at their annual meeting were told by President S. A. Morse that over $2,400,000 had been spent on capital expenditures including construction of a new pipe line to the border cities. Transmission lines had been built to several new districts, and the company had acquired control of gas distribution in both London and Hamilton. The artificial gas supply for Hamilton was being supplemented by natural gas made available by a pipe line constructed from the Norfolk-Haldimand area to Hamilton.

SHELL PIPE LINES

The Shell Pipe Line Co. has taken over the operation of all the field gathering lines which have been operated by the Shell Petroleum Corp. in the past, in the Tonkawa Field in Oklahoma. The move will eliminate a number of duplicate operations which have been necessary in the past.

Can Any Oil Company Afford to Court DISASTER by Accepting a Bid on Price Alone?

You have a better sense of values than to choose an airplane on a slight difference in price—if you could not be SURE of the plane's DEPENDABILITY.

You know also, that the RISK is out of all proportion to the saving, when a Pipe Line Contract is awarded to a firm of un-proven Reliability.

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"A TRUMAN-SMITH BID is the most economical in the long run"

Long miles upon miles of perfect pipe, with never a leaky joint—pushed to completion well AHEAD of schedule—that's what you see Truman-Smith doing here.

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The TRUMAN-SMITH CONST. Co.

EL DORADO, KANSAS.

Oklahoma City Production Is Increased

Big Field Is Permitted to Produce 203,170 Bbls. per Day During July. Hits New Peak on July 2

By W. A. Spinney
Staff Correspondent, Oklahoma Fields

The oil production of Oklahoma shows a large increase for the week ending July 4, due to the large gauges from the Oklahoma City Field on July 2 and 3, when the production rose to over 325,000 bbls. a day which is a new peak for the field. The state production for the seven days averaged approximately 591,000 bbls. a day.

The Oklahoma Corporation Commission ordered an increase in the oil production from the Oklahoma City Field during the next three months. For July the allowable flow will be 8 per cent of the potential which was established by the commission at 2,678,679 bbls. a day. The production in the capitol city field went on the new schedule of 203,170 bbls. a day on July 1, after having been operated on a 10 per cent basis the last four days in June. For the month of August the field will be placed on a 7 per cent basis of the potential of 2,790,871 bbls. a day, which will be 196,000 bbls. a day. In September the allowable will be 182,000 bbls. a day, or 6 per cent of the estimated potential of 3,222,582 bbls. The daily allowable for the field is based on the pipe line companies' nominations for the next three months.

At the Oklahoma Corporation Commission's hearing one of the field umpire's staff testified that the potential gauge of the field based on 4-hour gauges was 7,818,244 bbls. of oil a day. The commission accepts about one-third of this amount as the reasonable potential.

The commission also ruled that should a larger demand develop at any time during the three months' period, operators may petition for an increase.

No Potential Tests

Potentials which were due to be taken July 1, will be passed over for the three-month period since the decline is believed to have been negligible and not enough to warrant the extra expense. The petition of the Indian Territory Illuminating Oil Co. that the allowable be increased in the Silicious lime horizon so that the 69 producing wells may be permitted to flow 12,500 bbs. a day, which would be near capacity and thus recover approximately 600,000 bbls. of oil, which is believed would deplete the lime zone, was taken under advisement. The petition also stated that there are 28 wells in the group which cannot make their allowable oil production because of the water intrusion. It is believed by many to be the first move to exhaust the Silicious lime and plug all the wells back to the shallow gas sand. No provision was made for a decline in production, since the commission stated that there was virtually no decline in the potentials for the field as a whole, although some individual leases show some decline.

A New Peak

Oil production from the Oklahoma City Field reached a new high on July 2, when the field gauged 326,780 bbls. of oil in 24 hours from 129 wells. The pipe line companies and tank car shipments totaled 192,167 bbls. the same day, the difference going to lease storage in the field.

Many believe the establishment of a compulsory oil-gas ratio is needed to aid conservation in the Oklahoma City Field. The immediate need of an oil and gas ratio was pointed out by witnesses in the recent Champlin Oil & Refining Co. case in the federal court. It was brought out that some wells were found to be producing several thousand feet of gas to produce 1 bbl. of oil. Some companies have 400 to 1 ratio to produce oil while others use from 700 to 2,000 feet of gas to produce a barrel of oil. It is believed the high gas ratio will cause waste of gas and gas energy.

It is believed the gas wastage in the field is high and it has been estimated that the present gas production of the field is around 437,000,000 feet of gas a day and this amount furnishes almost peak loads for the gasoline plants in the field. It was estimated at the present time there is a wastage of approximately 270,000,000 feet of residue gas a day. Gasoline is recovered from the casinghead gas and much of the residue is sold in the field and for other industrial purposes. If the field is allowed a high gas-oil ratio the amount of casinghead gas would be increased which may result in a greater wastage of residue gas and gas energy. A low oil-gas ratio would reduce the runs to the casinghead plants and would reduce the waste of residue gas.

The commission's order held that wells designated as illegally overproduced or wells which are overproduced in violation of the orders shall remain shut in until such overproduction is made up and such wells are again even.

June's Production

Production of oil from the Oklahoma City Field was at a peak for the month of June, when a total of 5,163,593 bbls. was brought to the surface. The pipe line companies handled a total of 5,293,680 bbls. of oil during the month, indicating that considerable more oil was drawn from lease storage. Oil production for the month of May totaled 4,920,702 bbls. and the pipe line shipments totaled 5,019,545 bbls. At the beginning of June a total of 877,399 bbls. of oil was in lease storage in the field. The largest daily production and pipe line shipments came the last two weeks of the month after the crude oil prices had been reduced.

The 10 per cent allowable for the last four days of June failed to increase the production. Production with the number of wells producing and the pipe line shipments were as follows:

Date—	Prod.	Wells	Shipments
June 27	149,276	104	192,875
June 28	154,479	142	185,598
June 29	177,055	159	201,439
June 30	144,875	130	170,671

These figures show the production to be average compared to the previous week, while the pipe line shipments are slightly lower.

The increase in the production from the Oklahoma City Pool during the first few days in July was due to the operators shutting down the wells in the Oklahoma City Field over the holiday, which also included Sunday. Several operators have been curtailing all Sunday work in the Oklahoma City Field for the last several months.

The Prairie Oil & Gas Co. instructed the Prairie Pipe Line Co. to continue running the crude oil from the Bald Hill, Bixby and Morris districts in Muskogee, Tulsa and Okmulgee Counties. The new order came a short time after the contract for 100,000 bbls. of crude oil that the Standard Oil Co. of Louisiana purchased had been completed. The oil instead of moving southward to the refinery at Baton Rouge, La., will now move northeastward. The Prairie Pipe Line Co. will deliver the oil to the Ajax Pipe Line Co. at a point south of Tulsa.

Gas in Greer County

Many believe a new gas field has been found in Greer County in the southwestern part of the State. The wildcat test of Dobell and others, No. 1 Uffel, NW cor., Section 1-7-22w, is estimated to be good for 5,000,000 feet of gas a day from sand at 1,465-75 feet. The test was drilled to a total depth of 1,745 feet where a dry sand was found and the test was plugged back to test the showing of gas.

The wildcat test was started about a year ago and it has been shut down off and on during the year. The test was started because of the showing of gas found in an old test drilled in Section 36-7-21w. The test is located southeast of the Sayre gas field in Beckham County which has been producing for several years.

The only other production in Greer County is the Granite Field which was opened in 1921, by a test that found a showing of oil and gas at various depths. The first showing of oil in the test was found at 196 feet, the next at 330 feet with about 500,000 feet of gas at 700 and a showing of oil at 875 feet and another at 970 feet, with what was estimated to be 500,000 feet of gas at 1,085 feet. The test was drilled to a total depth of 1,582 feet.

The gas production in the Oklahoma Panhandle was extended during the week by the completion of the Western Production Co.'s No. 1 Gabel, C NE, Section 24-4-13 ecm, in Texas County. The well made 8,900,000 feet of gas a day from the Colorado shale at 2,640-75 feet. The total depth of the well is 2,680 feet. The well extends the gas producing area to the south of the Hugoton gas field in Stevens and Morton Counties, Kansas, and adds to the potential gas reserves in the area.

In Carter County

In the Tatums Field in Carter County the K. D. Oil Co. and Frank Gouin's No. 1 J. W. Burton, C SW NW, Section 30-1s-2w, a new producer on the southeast edge of the field swabbed 240 bbls. of oil in nine hours and was shut down. The test will be cleaned out because the mud has retarded the production. The liner will be rerun before the well is completed. The oil was found in sand at 2,182-2,299 feet and the total depth of the well is 2,300 feet.

Magnolia Petroleum Co.'s No. 1 Franklin, SW cor. NW NE, Section 15-1s-3w, a semiwildcat test about northwest of production was preparing to drill deeper after bailing 1 bbl. of oil in 12 hours. The showing was found in a series of sands

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WILDCAT OPERATIONS IN OKLAHOMA

(Descriptions are East and North unless marked otherwise)

NORTHERN OKLAHOMA

ALFALFA COUNTY

Company, farm and location—	Remarks:
Smith Brothers' No. 1 Forbes, SE cor. NW NW Sec. 12-27-11w	Shut down 1,232 ft.
J. W. Ridley's No. 1 Acre, SW cor. NE Sec. 14-24-11w	Shut down 5,502 ft.

ATOKA COUNTY

Campbell's No. 1 Baird, NW NE SW Sec. 31-1-13	Rig.
Moyer et al's No. 2 Miller, SW NE NW Sec. 26-1-14	Drlg. 341 ft.
Edgerton Edwards' No. 2 Rowland, SE NE NW Sec. 6-1-15	Rig.

BECKHAM COUNTY

Price-McFann's No. 1 Webster, C SW SW Sec. 34-8-26w	T. D. 2,344 ft.; plugged back to 1,890-1,900 ft.; 1,500,000 ft. gas completed.
Mid-Continent's No. 1 Schaff, C NE SW Sec. 22-11-22w	Waiting on cement to set 430 ft.
Mid-Texas Co.'s No. 1 Sidell, NE cor. SW SW Sec. 17-2-22w	Shut down 2,550 ft.
White et al's No. 1 Green, SW cor. Sec. 34-10-24w	Shut down 3,575 ft.

BLAINE COUNTY

Washoma Oil Co. et al's No. 1 Phillips, C NW SW Sec. 13-19-10w	Shut down 5,115 ft.

CADDO COUNTY

Abernathy & Brown's No. 2 Houston, Sec. 24-6-12w	Shut down 1,115 ft.

COAL COUNTY

McCraw Oil Co.'s No. 1 Ward, NE SE Sec. 35-1-8	Shut down 1,638 ft.
Whitney et al's No. 1 Miller, SE NE Sec. 10-2-8	Shut down 760 ft.

COMANCHE COUNTY

G. W. Stogner's No. 1 Doebel, C SW SW Sec. 3-3-9w	Shut down 1,450 ft.

LE FLORE COUNTY

H. E. Dowd et al's No. 1 Unknown, SE NE Sec. 17-3-22	Rig.

GARFIELD COUNTY

E. L. Love et al's No. 1 White, SE cor. NW, Sec. 9-24-6w	Shut down 5,850 ft.

GARVIN COUNTY

Malarnee et al's No. 1 Phillips, NE SW SE Sec. 24-2-2w	Drlg. 4,646 ft.
Skinner's No. 1 Elrod, SW cor. Sec. 13-2-3	Shut down 1,120 ft.

GREER COUNTY

French's No. 1 Murphy, SW NW Sec. 23-7-21w	Shut down 1,645 ft.

HARPER COUNTY

Sinclair Oil & Gas Co.'s No. 1 Howell, C SW SW Sec. 14-26-24w	20,000,000 ft. gas 5,350-5,400 ft.; total depth 8,539 ft.; shut down; sprayed 50 bbls. gasoline.

HASKELL COUNTY

Holden et al's No. 1 Ellis, CWI, NW NE Sec. 1-9-18	Drlg. 500 ft
Bowers Oil & Gas Co.'s No. 1 Black, Kent Townsite, SE SW SW Sec. 31-8-20	Drlg. 505 ft.
Ault et al's No. 1 Harrison, CWL SE NE Sec. 14-9-19	Shut down 650 ft.
Ault et al's No. 1 Hall, NW SW SW Sec. 14-9-19	Shut down 2,000 ft.
Ault et al's No. 1 Hall, SE NW Sec. 25-9-19	Shut down 200 ft.
Holden's No. 1 Phillip, SE cor. Sec. 3-9-18e	Shut down 1,860 ft.
Marion Oil's No. 1 Sanders, NW NE NW Sec. 10-9-18e	Shut down 2,387 ft.

HUGHES COUNTY

Wright et al's No. 1 Ott, SE SW Sec. 15-5-11	Shut down 1,645 ft.

KAY COUNTY

Lewis et al's No. 1 Harris, SE NW Sec. 14-25-1	Location.
Mummert Drlg. Co. et al's No. 1 Cormick, C NW SE Sec. 9-27-2	Cleaning out 3,693 ft.
Blackwell Oil Co.'s No. 1 Harshman, Sec. 2-26-1w	Rig on ground.

KIOWA COUNTY

Christian's No. 1 Jones, NE SE Sec. 8-7-18w	Drlg. 590 ft.

LATIMER COUNTY

P. English's No. 1 Unknown, NW SE Sec. 16-6-19	Shut down 1,542 ft.

McINTOSH COUNTY

Patterson et al's No. 1 Smith, SW cor. NW SE Sec. 32-9-16	Drlg. 5,726 ft.

MURRAY COUNTY

C. R. Williams et al's No. 1 Williams, C NE NE Sec. 21-1-4	Shut down 884 ft.

MUSKOGEE COUNTY

Sioux Oil Co.'s No. 1 Unknown, NW SE Sec. 21-11-19	Shut down 1,011 ft.

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Kansas Wants Increase in Production

State Has Been Underproducing, but Will Soon Have Pipe Line Facilities From Ritz-Canton Pool. Increased Potential

By W. A. Spinney
Staff Correspondent, Kansas Fields

According to an announcement made by Thurman Hill, a member of the Public Service Commission, Kansas will ask the nine-state oil advisory committee to increase the State's allowable from 110,000 bbls. to 125,000 bbls. a day. The next meeting of the committee is in Amarillo, Tex., July 7. The State has been producing around 102,000 bbls. of oil during the last few months, but Mr. Hill stated that the State wants an outlet for greater production when the market demand increases.

Production from the State during the week ending July 4 was approximately 102,900 bbls. a day, which is an increase of approximately 1,000 bbls. a day over the previous week. The increase in the Voshell Pool in McPherson County which was due to deeper drilling was believed to be the cause of the State's increase in production.

The city of Canton, McPherson County, on the east edge of the Ritz-Canton Pool, has passed an ordinance to prohibit drilling of wells inside the corporate limits. The ordinance provides, however, that any drilling must be done under a permit. The permit requires a bond to protect the offset acreage and nearby property from damage. The nearest drilling test to the townsite is located a half mile west.

Asks for Orderly Production

During the week Thurman Hill, a member of the Public Service Commission of Kansas, announced that the commission would ask the state attorney general to investigate the possibilities of enforcing conservation measures in the Hugoton gas field in southwestern Kansas. It is believed the recent oil proration law enacted by the last legislature did not apply to gas production, but there is an old statute which could be used to prevent the use of "artificial devices" in taking gas production from the wells.

It is believed by the members of the Public Service Commission that some of the operating companies with gas production in the Hugoton gas field were preparing to connect the wells to the pipe lines. If they are not restrained by conservation methods, it was estimated that within a few years the gas would be drained from the producing horizon and after the gas was exhausted the field would be ruined by salt water. The enforcement of the conservation measure is believed to indicate that the companies owning acreage and production in the field will start a development program and build up an additional potential reserve in the near future.

Deepening in Voshell

In the north end of the Voshell Pool in McPherson County, the deepening of producing wells that were completed in the Viola lime to the Silicious lime is in progress. The deepening of these wells has increased the crude oil output. Sinclair Oil & Gas Co.'s No. 2 McCurdy, in Section 33-20-3w, had an increase of 900 bbls. a day. The well was drilled deeper to the Silicious lime at 3,328-31 feet where it flowed 1,200 bbls. a day. Other wells are expected to be drilled deeper.

The Gypsy Oil Co.'s No. 3 Rose Hamant, in Section 14-26-2, in the Greenwich Pool in Sedgwick County, found an increase in production in the Simpson sand after being drilled deeper. The well is now making 300 bbls. a day from the Simpson sand at a total depth of 3,308 feet. The well was drilled deeper in search of another pay horizon when the production declined.

Pipe Line Construction

The White Eagle Oil & Refining Co. will start construction work on its new 8-inch pipe line from the company's refinery at Augusta in Butler County to the Ritz-Canton Pool in McPherson County, in a few days. Bids on the $500,000 project will be received and the contract let during the week. It is reported that construction work on the gathering lines and the main line will be let in the same contract. It is estimated that approximately 14 miles of gathering line will be needed in the field. The pipe line project also includes the installation of two 5,000-bbl. tanks and a pump station. The pipe line is expected to have a capacity of approximately 11,000 bbls. a day. The gathering lines are expected to be completed by July 15, and the main line probably be completed and in operation about six weeks later.

The next potential gauge to be taken in the Ritz-Canton Field will be two weeks before the completion of the White Eagle Oil & Refining Co.'s pipe line. The last potential gauge showed the field had a potential of 94,000 bbls. a day and since that time several additional wells have been completed.

The Ritz-Canton Pool is the most active area in the State. There are 72 operations under way in the field. The Tidal Oil Co. and others' No. 1 Day, SW cor. NW, Section 32-19-1w, shot the Viola formation after plugging back to 3,430 feet. The test swabbed 7 bbls. of fluid per hour. The pay was found in the Viola at 3,418-26 feet.

In the Decker Field

A large number of tests in the Ritz-Canton-Decker gas area are expected to be completed in a few days. Sinclair Oil & Gas Co., Wolf Creek Oil Co. and others' No. 1 Krehbiel, NE cor. NW NW Section 25-19-2w, was showing gas in the chat. The top of the chat was found at 2,912-14 feet, and the crew was underreaming the 8-inch casing to shut off the water. The 8-inch casing will be lowered to the bottom of the hole and cemented. The Sinclair Oil & Gas Co. and others' No. 1 Krehbiel is a south offset to the Youker Drilling Co.'s No. 1 Gratton, a gas producer, and is located in the southern part of the Decker gas field. The test is a mile west of production in the Ritz-Canton Field.

Other tests in the Decker gas field which are expected to drill into the chat where the gas is found are McPherson Oil & Gas Co.'s No. 3 Meyers, C NE SE Section 14-19-2w, which is rigging up standard tools to test deeper into the chat, which was found at 2,893 feet. The same company's No. 2 Hill, C SW NE Section 10-19-2w, was drilling in the chat at 2,923 feet with nothing showing. The test offsets the Rush Drilling Co.'s gas well. The McPherson Oil & Gas Co.'s No. 4 Decker, C NW SE Section 11-19-2w, is a new location on which a rig is being built.

A showing of gas was found in the test of the Lario Oil & Gas Co.'s No. 1 Miller, NW cor. SE Section 24-19-2w, in the chat at 2,915-25 feet. The 8-inch casing is being lowered to the top of the sand to shut out the water.

The Mid-Kansas Oil & Gas Co.'s No. 1 Whitright, SW cor. Section 30-19-1w, is still fishing for collapsed casing at a total depth of 2,963 feet. Same company's No. 1 Unruh, SE cor. SW Section 25-19-2w, was making preparations to drill deeper into the chat after cementing the 8-inch casing at 2,923 feet.

Sedgwick County Field

Production in the Valley Center Pool in Sedgwick County, where the first oil was discovered in the county, continues at a steady rate. The production in that pool is higher than in the Eastborough Pool which was developed during the last part of 1930 and the early part of 1931. The daily average production for the Valley Center Pool for the week ending July 4 was approximately 6,920 bbls. and the Eastborough Pool shows a daily average for the same time of approximately 5,300 bbls. The Voshell Pool in McPherson County continues to lead the State in daily average production with approximately 18,000 bbls. The Ritz-Canton Pool production is being held to approximately 6,000 bbls. a day although it has a daily potential of better than 100,000 bbls. a day. The lack of pipe line outlet holds the allowable down to a low figure.

Two pools in Sedgwick County are making considerable amount of water, the 42 wells in the Eastborough Pool, are making approximately 4,000 bbls. of water a day.

The Derby Oil Co.'s No. 6 Eastborough, SE cor. NW NE. Section 19-27-2, in the Eastborough Pool, found the chat at 2,987-92 feet and plugged back to 2,988 feet where it swabbed 230 bbls. of oil and 450 bbls. of water the first 24 hours.

Rice County Wildcats

Near Raymond in Rice County, Starke and others' No. 1 Sharpe, NE cor., Section 13-20-10w, is standing full of oil from the Silicious lime at 3,333-39 feet. The operators had not made a production test up to the last report.

Other wildcat tests in the county are Solar Oil Co.'s No. 1 Zink, SE cor. NW, Section 3-19-10w, Rice County, found a hole full of water in the shallow sand at 2,495-2,515 feet and are underreaming the 8-inch casing to the bottom of the hole.

The Tidal Oil Co. and others' No. 1 Davis, in Section 6-24-12, in the Patterson Pool, in Greenwood County, is estimated to be a 300-bbl. well. The oil was found in sand at 1,722-56 feet. It will be given a shot and put to pumping.

On the Ellsworth Arch

Gypsy Oil Co. and Tom Palmer's No. 1 Stoddenberg, C SW, Section 22-16-10w, in southwestern Ellsworth County, is standing with 3,250 feet of oil in the hole while lease storage is being erected. The oil was found in the Silicious lime at 3,330-40 feet. The test was drilled on the Ellsworth Arch on which 17 other wildcat wells have been completed during the last year and a half, which are estimated to have a daily potential of 35,000 bbls. These have never been produced owing to the lack of a pipe line outlet.

Dewey & Mitchell and others' No. 1 Greenawalt, C NW, Section 17-19-16w, Rush County, is expected to reach the gas horizon in a few days. The 6-inch casing was being underreamed at a total depth of 3,580 feet. The gas horizon is expected at 3,650 feet.

Chase County

Kline and others' No. 1 Stewart, C NE SE, Section 20-19-6, has been completed for 300,000 feet of gas in sand 522-31 feet.

Chautauqua County

Leighty and Prairie Oil & Gas Co.'s No. 1 Lemert, NE cor. SE, Section 36-34-9, is a machine.

Cowley County

Suppes and others' No. 2 Reynolds, SW cor. SE, Section 33-32-7, has been abandoned at 2,799 feet. Lehman and others' No. 1 Hill, SE cor. NE. Section

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WILDCAT OPERATIONS IN KANSAS

(Descriptions are East unless marked otherwise)

Company, farm and location—	Remarks:
BARTON COUNTY	
Syndicate Oil Co.'s No. 1 Boertz, NW SE SE, Sec. 13-18-12w	Shut down 2,440 ft.
Skelton Oil Co.'s No. 1 Ott, C SE SE Sec. 16-19-14w	Underreaming csg. 2,420 ft.
McCool et al's No. 1 Tsern, NW SE NE Sec. 12-20-11w	Shut down 1,600 ft.
CHASE COUNTY	
Borden et al's No. 1 Atkinson, NW SE S.c. 18-18-7	Rig on ground.
CLAY COUNTY	
Crystal Oil et al's No. 1 Tivier, SW cor. Sec. 19-8-2	Shut down 2,700 ft.
COFFEY COUNTY	
Heyburg's No. 1 Kroft, SE SW SE Sec. 30-22-14	Shut down 1,565 ft.
COWLEY COUNTY	
Fisher et al's No. 1 Hurt, C SW SE SE Sec. 11-34-3	Rig.
Roth & Faurot's No. 1 Reedy, SW NW NE Sec. 8-32-8	Abandoned 1,040 ft.
DICKINSON COUNTY	
Severs et al's No. 1 Lavengood, NE SW Sec. 13-13-2	Fishing 3,915 ft.
ELLSWORTH COUNTY	
Keyes Bros.' No. 1 Gregory, SW cor. Sec. 23-16-9w	Rig.
Hershey et al's No. 1 Schultz, C NE Sec. 9-14-8w	Fishing 3,130 ft.
Alyward et al's No. 1 Stratman, SE NW SE Sec. 1-17-10w	Silicious 3,255-71 ft.; 117 bbls. 2 hrs.; shut in; est. 2,000 bbls.; no pipe line connection.
Aladdin Pet.'s No. 1 Stoddenberg, C SW Sec. 22-16-10w	Silicious lime 3,332-40 ft.; show oil.
Milton et al's No. 1 Kester, SE NE Sec. 6-14-9w	Drlg. 3,150 ft.
FORD COUNTY	
Carter Oil Co.'s No. 1 Everett, C NE Sec. 22-29-21w	Drlg. 4,967 ft.
Swain et al's No. 1 Taylor, C NW Sec. 21-25-24w	Shut down 5,105 ft.
GRAHAM COUNTY	
Schleimeyer et al's No. 1 Clark, SW NE NE Sec. 11-9-25w	Drlg. 4,560 ft.
HARPER COUNTY	
Beeler et al's No. 1 Bear, C NE Sec. 21-36-6w	Abandoned 1,830 ft.
KINGMAN COUNTY	
Skelly Oil Co.'s No. 1 Miles, NE cor. Sec. 30-27-10w	1,635-40 ft. 2,000,000 ft. gas; at 2,005-20 ft. 6,000,000 ft. gas; at 2,133-42 ft. 3,000,000 ft. gas; showing oil 5,385 ft.; T. D. 3,441 ft.; shut down; estimated at 600 bbls. a day.
HARVEY COUNTY	
J. P. Flannigan's No. 1 Sheridan, C SW Sec. 32-22-1	Rig.
LINCOLN COUNTY	
Buck et al's No. 1 Schulz, C SE NE SW Sec. 19-11-6w	Rig on ground.
MARION COUNTY	
Midwell's No. 1 La Master, NW cor. Sec. 31-22-4	Shut down 650 ft.
MORTON COUNTY	
Hydraulic Oil Co.'s No. 1 State Land, NW SE Sec. 22-34-43w	T. D. 3,640 ft.; shut down.
MORRIS COUNTY	
Urschel et al's No. 1 Bersuch, NW SE NW Sec. 10-17-7	Machine.
Hankerson et al's No. 1 Cessman, SW SE Sec. 24-16-9	Drlg. 2,478 ft.
NORTON COUNTY	
Richards et al's No. 1 Colby, Sec. 17-4-21w	Rig.
OSAGE COUNTY	
Briggs & Smith's No. 1 Wood, SE NW Sec. 21-14-15	Shut down 1,050 ft.
Fields' No. 1 Usker, SE cor. Sec. 35-16-17	Shut down 400 ft.

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Better Well Found in Somerset County

Test in Quemahoning Township Showing for a Fair Gas Well. Most Interesting Test Drilled in Eastern Fields This Year

By Staff Correspondent

PITTSBURGH, Pa., July 6. — The most interesting test completed in the lower eastern fields so far this year was recently drilled in in Quemahoning Township, Somerset County. It will be recalled that last year the American Natural Gas Co. completed a test east of Laurel Ridge and just west of Negro Mountain, which, though in geologically condemned territory, came in showing for about 750,000 feet of gas a day. The gas gave evidence of being of a strong petroleum gas content. Four tests, west and located on a north and south line, proved dry with the exception of one small pocket in a test on the Mull farm. Recently this company drilled a test on the William Henry Miller farm, north and to the east of the discovery well, the O. S. Miller well, and about a third of a mile distant. It was completed in same sand as the first strike, and at a depth of 2,650 feet compared with the original 2,552 feet and it is showing for a fair gas well which may prove larger than the original. The third test in the same structural line is now drilling on the Maust farm and is down to about 800 feet. This well is about a half mile from the second producer and, if a producer, will move the territory in that direction. This new operation is the most easterly gas production in the lower fields and the nearest producer lies west by at least 20 miles.

There were 20 wells completed in the three divisions of the eastern fields during the week and but one dry hole reported. Southeast Ohio again led in total initial production and West Virginia in total new gas wells. The number of gas wells was 12, of which 3 were fair; oil producers numbered 7, with an initial production of 62 bbls., and the one duster was in Southwest Pennsylvania.

SOUTHEAST OHIO

The best producer in Southeast Ohio was a test reported dry last week but which was drilled deeper. It was the test of the Fritz Oil & Gas Co. on the Swingle heirs farm in the NE Section 29, Brush Creek Township, Muskingum County, which was drilled deeper from the Clinton sand and 4,178 feet to the Medina sand at 4,250 feet. After shot, it produced 50 bbls. the first 24 hours, and will probably make a very fair pumper. Another fair well was the second test of the Kelch Brothers on the L. P. Backus farm, near New Plymouth, in Section 35, Brown Township, Vinton County. It is a fairly heavy gas well in the Grit at 975 feet and was gauged at 1,000,000 feet a day.

There were two completions in Noble County, both small. In the SE Section 32, Marion Township, H. G. Clymer and others drilled a test on the Iva Masters farm which is showing for a very light gas well. The gas was struck in the Grit sand at 1,870 feet but the well was drilled to a total depth of 1,930 feet. Wiper, Smith and others completed a test on the Wiper heirs farm in the NE Section 6, Jefferson Township, in the Buell Run sand and the production the first 24 hours was but a quarter of a barrel with plenty of water with it.

In Washington County, Otto Heldman and others completed a test on the Joseph Doyle farm, Section 14, Liberty Township. It is a gas well rated at 50,000 feet from the Keener sand at a depth of 1,201 feet. In Section 14, Palmer Township, F. M. Russell and others completed No. 33 on the F. R. Cozzens farm at a depth of 532 feet and in the First Cow Run sand. It will make a small pumper.

Drilling in Ohio

In Tuscarawas County, the Ohio Falls Drilling & Supply Co. is hauling in a rig on a location on the Harvey Long farm, Lot 22, Clay Township. In Washington Township, the Hopewell Fuel Gas Co. is down to 350 feet on the Jasper N. Quigley farm, Lot 23, and Gordon Oil Co. No. 3 and others have a rig standing for No. 4 on the Ralph Huffman farm, Lot 35. In Guernsey County, the Kemrow Co. is building a rig for No. 3 on the J. W. Fowler farm, Section 10, Wheeling Township.

In Athens County, the Union Drilling & Producing Co. is down to 1,200 feet in a second test on the W. H. Powell farm, Section 23, York Township, and in the same district, but Section 35, the Hocking Valley Drilling Co. and others have reached 2,200 feet in a fourth well on the Hocking & Athens Coal Co. tract. In Berne Township, the First National Bank No. 23 of Marietta is drilling No. 7 on the J. R. Winner farm, Section 14. In Hocking County, R. W. Porter and others have reached the 2,400-foot level in a second test on the Lick Run Coal & Clay Co. No. 2 lease in York Township, and Section 4. In Starr Township the Associated Oil & Gas Co. has a rig standing on the A. L. Jones farm, Section 4.

In Jefferson County, the deep test of the Benedum & Trees Co. on the Wayne Coal Co. tract in Section 26, Island Creek Township, is standing at 5,300 feet with reports that it will be drilled deeper. Medina County is still active in the shallow sands area with but one test drilling among the numerous reports. This test is being drilled by E. R. Edson & Son Co. on the Mary L. D. Yost farm in the NW Section 1 and has reached 200 feet. In Meigs County, James Simpson is down to 300 feet on his own property in Sutton Township.

WEST VIRGINIA

To break the long dry streak, there were four oil completions reported from West Virginia, none large. The request of the pipe line companies operating in this state to adhere to the oil board's curtailment program of producing only 70 per cent met with gratifying results from the majority of the producers. The Valvoline Pipe Line Co. recently sent out a letter similar in content to that of the Eureka Pipe Line Co. which asked for strict adherence to the production percentage.

In Harrison County, the Hope Natural Gas Co. completed a second well on the Thomas S. Morris farm, in Ten Mile district. It was drilled in the Gordon sand at a depth of 2,850 feet and is showing for a half barrel well. In Pleasants County, the First National Bank of St. Marys drilled No. 8 on the Boyd heirs farm in the Cow Run sand at a depth of 367 feet. It is rated as a 4-bbl. pumper.

On the waters of Sheep Run, Grant district, Ritchie County, the Daniel O'Day estate completed No. 5 on the Biddie Deems farm in the Salt sand. It is estimated good for 5 bbls. a day. On Dry Ridge, in the same district, R. B. Roberts drilled a test in the Big Injun sand on the L. Hammond farm. It will make a small pumper from that formation.

Gas Wells

Probably the best gas well completed during the week in West Virginia was in Mingo County, where the United Fuel Gas Co. completed No. 4,300 and on the Central Trust Co.'s lease. It went in the Big Lime at 1,550 feet and is producing about 1,500,000 feet a day. In Cabell County there was one completion, the test of the Madison Gas Co. on the Richard Holton farm in McComas district which went in the Big Lime and is showing for a gas well at a depth of 1,375 feet.

In the active Calhoun County there was but one new well. On the waters of Yellow Creek, Sheridan district, the Chemical Oil Co. in a second test on the A. T. Yoak farm got a 500,000-foot gas well from the Salt sand formation. In Union district, Harrison County, the Reserve Gas Co. drilled No. 157 and on the Wesly Williams farm to a depth of 3,262 feet and in the Speechly sand. It is rated as a small gas well.

In Ritchie County, D. J. Gribble completed a test on the Arley Taylor farm in Clay district rated as a gas well. In Wetzel County, the Manufacturers Light & Heat Co. completed two wells. Its second test on the J. M. Newman farm was drilled to 3,250 feet and in the Maxon sand and is showing for a fair well. This location is in Proctor district. In Church district, No. 3,468 on the Isaac Byrad farm was drilled deeper and completed at 3,233 feet and also in the Maxon sand. It was also a gas well.

Drilling in West Virginia

Drilling continues fairly active in Lincoln County. In Sheridan district, the Martin Gas Co. has reached 1,375 feet on the Sherman Johnson farm, and the Empire State Gas Co. 500 feet in a second test on the B. L. Butcher farm. In Jefferson district, the Cambridge Gas Co. is down to 1,660 feet on the George Thompson farm. In the same district, Pridemore and Adkins have made a location on the M. S. Miller and R. Topper lease. The David Gas Co. has reached the Beren sand at 2,443 feet in No. 4 on the David Miller farm, and the Jefferson Gas Co. has hauled in part of the materials for a fourth well on the Richard Miller farm. In Carroll district, Louis R. Sweetland, agent, is drilling at 400 feet in a second test on the L. R. Sweetland farm, and the Katherine Moore, Administrators, are down for water in their No. 8 B. F. Roberts. In Union district, the Woodyal Gas Co. has its second well on the James Walker Adkins farm down to 1,220 feet and making good progress. In the same district, the Hamlin Natural Gas Co. has made a location for No. 2 on the Matthias Adkins farm. In Harts Creek district, Frank Yates is shut down in a test on his own farm after reaching 1,810 feet.

In Mingo County, the United Fuel Gas Co. is carrying on extensive work. In Hardee district, its No. 4,332 has reached a depth of 1,715 feet on the Cotiga Development Co. tract and has made a location for No. 4,331 on the same lease. On the Central Trust Co. lease in Warfield district, three wells have recently been completed, and the company is building roads to five more locations, Nos. 4,324, 4,326, 4,327, 4,328 and 4,329. On the Cowden and Workman farm in Harvey district, the Ohio Southern Gas Co. has built a rig for a test of that district.

In Wetzel County the Manufacturers Light & Heat Co. has No. 3,493 on the M. Bartrug farm in Church district at the 750-foot level. In Clay district the same company is down to 2,875 feet in drilling deeper No. 2,190 on the A. and M. E. Jolliffe farm. In Church district, the Lomie Oil & Gas Co. has reached 1,400 feet on the Lomie Hunt farm. The Pittsburgh Coal vein was found at 916 feet.

In Boone County, activities have slackened. Godfrey L. Cabot has the following work in progress: A test is drilling at 990 feet on the Central Trust Co. tract; a road is being cleared for a second test on the J. Q. Dickinson farm; No. 5 on the Mary Dickinson farm drilling at 1,450 feet. On the Federal Coal Co. tract, No. 47 is drilling at 1,715 feet, No. 48 is drilling at 1,454 feet, a rig is up for No. 46, and a location made for No. 31. All of this is located in Sherman district. In Scott district, there is little work noted.

SOUTHWEST PENNSYLVANIA

In addition to the Somerset County wildcat, there were two other completions in Southwest Pennsylvania. In East Finley Township, Washington County, H. V. Sprowls and others' test on the C. Sampson farm proved dry. In the same township, the Union Gasoline & Oil Corp. completed a gas well on the W. Stout farm.

In Wayne Township, Greene County, the Manufacturers Light & Heat Co. is about due in with its No. 3,443 on the Felix Bell farm, the hole being down to 3,070 feet. The same operators are down to 3,000 feet in drilling deeper No. 2,851 on the J. J. Griffith farm, Center district. In the same district, the Carnegie Natural Gas Co. has shut down operations in its test on the F. G. Jacobs farm, after reaching 2,320 feet. J. B. Orndoff has run into casing trouble at 2,200 feet in a test on the J. E. Scott farm and shut down.

LYCOMING HAS 70,000,000-FOOT GASSER IN TIOGA COUNTY, PA.

CORNING, N. Y., July 6.—The Lycoming Natural Gas Co.'s No. 1 Close in the Tioga County gas field, Pennsylvania, is a 70,000,000-foot gas well. It is located 1,000 feet northeast of the biggest well in the field, the Penn United Gas Co.'s No. 1 Meaker, which was rated at 100,000,000 feet and which blew wild for about two weeks last February.

The new well marks the fourteenth gas producer in the Tioga Field, and brings the rated potential gas supply for that field up to 305,000,000 feet per day.

On the New York State side of the New York-Pennsylvania gas field the Wayne-Dundee Field is credited with a potential of 265,000,000 feet. The Witmer Oil & Gas Co.'s No. 12 Olszewski, latest completion in the Wayne Field is a 7,000,000-foot well.

A wildcat gas test on the Onondaga Hills in Onondaga County, west of Syracuse, N. Y., known as the Kline-Luffer well, was abandoned as a failure after having been drilled to a depth between 5,100 and 5,200 feet. Another wildcat, the Midvale Gas Co.'s No. 1 at Jordan, N. Y., in Onondaga County, was cleaning out cave at 3,100 feet.

The drilling of several dry and salt water holes in the recent past has changed the complexion of the Tioga gas field considerably, the failures serving to more definitely define the field. Nearly 20 wildcats which have been under the close surveillance of operators during the drilling have failed to produce during the field's developments. Several of these were completed recently. With the cost of drilling Tioga Field wells estimated at about $20,000 per well the cost for the wildcatting in that area has been listed as between $350,000 and $400,000. The magnitude of the enterprise is evident by these figures.

Rochester Turns It Down

President Herman Russell of the Rochester Gas & Electric Corp. does not believe that conditions in the Wayne Field

(Continued on Page 85)

Look at the average new skimming plant in a flush field

Thirty gallons of fuel oil goes into storage for every 12 gallons of gasoline that goes into the tank car

Straight-run gasoline

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What's the use?

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Guadalupe Well Now More Encouraging

Chances in That Territory Now Regarded as More Favorable. Extension of Bruner Field to South Indicated. New Bastrop Test

By B. D. Stevenson
Staff Correspondent, Southwest Texas Fields

SAN ANTONIO, Tex., July 6.—W. J. Walton's No. 1 Zoboroski in Guadalupe County, 6 miles southeast of Sequin and the same distance southwest of the Darst Creek Field, at 2,210 feet with top of the chalk at 2,183 feet, stood 1,000 feet in oil after being bailed down and given time to fill up. It rose 250 feet in five hours. The oil is 31.4 gravity and is coming from the Austin chalk. It is thought to be about a 25-bbl. well where it is as the Austin chalk does not give up much oil. The debate is whether to carry it to the Edwards lime or complete it and drill another to the Edwards. The well has rather improved in appearance since a week ago and the chances seem more favorable for that territory where operators have been trying to pick up an extension of the faulted conditions which would result in another pool. The trend of the old Luling and Darst Creek and Bruner Fields is toward the Dale Serpentine plug field in eastern Caldwell County and the axis of the fields would come to a point in the Dale Field. The Walton test looks as though it would be on another fault between the Luling and Darst Creek Fields and with the same general trend toward the Dale Field.

In the Bruner Field Joe Bruner has his No. 1 Malone in the south end of the field down below 2,250 feet and should be in the chalk soon. It has been showing a little gas and looks favorable. The Radcliffe well, one location northwest, has been heading up at intervals and making a little oil. The Bruner development stopped in the early days of the field with the Radcliffe test on the supposition that when it failed to make a big well the field ended there. It is believed now there is a fault to the northwest, tests a few locations to the northwest are on pump and have been and unless there is a fault between it is thought the Radcliffe well would not head up. There are geologists who look for an extension of the Bruner Field to the south as a result of No. 1 Malone.

Ogden has abandoned his No. 1 Alexander a little southwest of the Dale Field which had a little oil in the Edwards lime at 2,353 feet but not enough to make a well. It was planned to come back and test the chalk but this was not done. Mills' No. 1 McMahon at 2,495 feet is still fishing and J. A. Harper's No. 4 Strawn in the Lytton Springs Townsite Pool, where there are a few wells in the Serpentine, is dry and abandoned in Serpentine at 1,900 feet, topped at 1,660 feet.

M. O. Rayor's No. 1 Dunlop, between the town of Luling and the Luling Field, at 2,520 feet, which had a little oil in Edwards, is still not a well. It was plugged back to get rid of salt water and when tubing was run made a head of about 25 bbls., but there is nothing visible at this time to indicate any such production as the most of the wells made from Edwards in the other three Edwards lime fields. No. 1 Dunlop is going on the pump for a further test.

Other operations in the Balcones region have made little progress. In the upper end of the region where Eddington in Falls County last year completed a small well at about 1,000 feet his No. 3 Llewellyn is dry and abandoned at 1,086 feet where it had a fishing job. And in northern Travis County, south of the Chapman Pool in Williamson County, Taylor Production Co. months ago got a small well in Serpentine but No. 2 Smith is dry and abandoned at 940 feet in Serpentine.

In the territory northeast of Elgin in northern Bastrop County, Texas Development Co. is starting a new test. There was some interest last year in that region due to an old abandoned wildcat seeping out a little oil. It has been a popular territory with wildcatters. The new test is No. 1 C. H. Ray, 400 feet from the south line and 800 feet from the west line of the tract in the Thomas Christian Survey.

Bee County Work

J. M. Davis started late in the week to drill in and complete his No. 1 Ray a mile southwest of the townsite of Pettus with total depth 3,925 feet. Casing was set some days ago and it has been waiting on pipe line connection. Half way between it and the townsite pool Mauldin's No. 1 Fee at 3,861 feet had a showing of oil and on the strength of the Davis test he deepened to 3,930 feet and a drill stem test showed only one joint of oil and considerable mud. This seems to strengthen the idea that there is a fault line west of the field for the production in the townsite pool is slightly deeper than in the Davis test. The idea on which the geology of Davis' location was worked out was that of a separate pool southwest of the townsite pool.

Other operations in the Pettus area are at a standstill except that the United Production Co. is rigging up on No. 39 Ray, the location being on the north edge of the Ray-McKinney Pool and almost a sure shot for a producer. Cosden is making hole in No. 2 Freeland in the Cosden Pool 2 miles west of the Pettus Townsite and is down around 2,000 feet.

Live Oak County

Houston Oil Co. is waiting for standard rig to put No. 23 Cartwright on the pump at 3,565 feet where it has previously been reported in a new sand that swabbed 77 bbls. in 2½ hours. It is also rigged up and ready to go on No. 14, which is 1 000 feet west and was a gas well at 2,292 feet.

No. 23 Cartwright attracts attention to that part of the country. Grebin & Wood's No. 1 Riggs in Bee County, 6 miles northeast of the Cartwright Field in Live Oak County, is down 4,212 feet and in hard sand. It has not had anything particularly encouraging thus far. Alexander's No. 1 McFall, 12 miles east of the Cartwright Field and in southern Bee County, 3 miles south of Skidmore, is shut down at 1,510 feet, scarcely deep enough yet to tell much.

Five miles north of the Cartwright Field Catlett & O'Neill are getting ready to drill No. 1 Hatcher which is to be a 5,500-foot test.

Twenty miles southwest of the Cartwright Field Carsil Oil & Gas Co. has started No. 3 McGill and is down about 1,500 feet. It is in Jim Wells County, 450 feet south and 350 feet east of No. 1 McGill, which came in a big gas well but was lost at around 2,600 feet. No. 2 was drilled 900 feet north and was a dry hole.

Northeast of the Pettus Field, F. P. Zoch has been making fast time in No. 1 Dobard, 40 miles northeast of the Pettus Field, but about in line to pick up the same sand at reasonably near the same depth. He had a slight show at 3,248 feet but it developed nothing on a test. The well is in Lavaca County, 2 miles southwest of Ezell.

In Goliad County, 12 miles or so northeast of the Pettus Field, the Southern Crude Oil Purchasing Co.'s No. 1 Pettus, which stopped at 3,853 feet and was abandoned a year ago, has been cleaned out by V. F. Neuhaus down to 3,200 feet.

Corpus Christi District

There was less development the past week in the Corpus Christi district than for some time. The Houston Oil Co. made more hole in No. 2 Rand Morgan, which at last reports was below 5,950 feet and drilling. The company's No. 1 Lawrence that blew out and ran wild and was afterward closed in at 2,740 feet has not yet been completed. The company is working with it and has put in a big cement block around the top as the gas pressure seems yet to be very strong. It will probably be completed at that depth.

North of Corpus Christi in San Patricio County the Aransas Oil Corp. is getting ready to do some further development on the Welder Ranch where the company recently completed a good, big gas well. Jacob, Buzzini & Pickett are fixing to start their No. 2 Baldwin in the same district and there is a chance that that new gas pool will be developed.

Farther north in the direction of the

(Continued on Page 84)

SOUTHWEST TEXAS PROVEN AREAS

COOKSEY POOL—BEXAR COUNTY

Company, farm and location—	Remarks:
Penn Oil Co.-Sun Oil Co.'s No. 1 Pollok, 1,100 ft. SW of No. 1 Cooksey in John W. Raill Sur.	T. D. 1,420 ft.; reset csg.

DOBROWOLSKI POOL—BEXAR COUNTY

Patton & Yocum's No. 1 T. Strunk, 1,351 ft. from SE line, 150 ft. from NE line of tract	T. D. 727 ft.; installing pump.
W. S. Rogers et al's No. 1 L. Donnop, Juan Montes Sur.	T. D. 612 ft.; shut down.

BRUNER POOL—CALDWELL COUNTY

Joe Bruner's No. 1 Malone, A. Floyd Sur.	T. D. 2,050 ft.; drlg.

LYTTON SPRINGS—CALDWELL COUNTY

J. A. Harper's No. 4 Strawn, 150 ft. from N and E lines of tract in Pablo Martinez Sur.	T. D. 1,540 ft.; shut down.

EDDINGTON POOL—FALLS COUNTY

Eddington et al's No. 2 Llewellyn, George Allen Sur.	T. D. 1,070 ft.; abnd.

DARST CREEK FIELD—GUADALUPE COUNTY

Magnolia Pet. Co.'s No. 8 M. T. Klein, 300 ft. SE of No. 1	T. D. 1,600 ft.; drlg.

CHAPMAN POOL—WILLIAMSON COUNTY

Chapman et al's No. 2 Lawrence, S. Miller Sur.	T. D. 1,916 ft.; set 6⅝-in. csg.; waiting on cement.
Vitex Oil Co.'s No. 8 Kilgore, Simon Miller Sur.	T. D. 1,735 ft.; waiting on cement.

PETTUS POOL—BEE COUNTY

Cosden Oil Co.'s No. 2 J. M. Freeland, in John Pace Sur. No. 1	T. D. 260 ft.; set surface csg.
J. M. Davis et al's No. 1 Ray, 330 ft. from N and E lines of John W. Williamson Sur.	T. D. 3,925 ft.; waiting for pipe line connection.
J. L. Mauldin's No. 1 fee, 1,300 ft. N of S line, 150 ft. E of Medio Creek, Kerr Sur.	T. D. 3,930 ft.; deepened; tested 15 ft. oil, 20 ft. mud.
Geo. N. Moore et al's No. 2 Freeland in John Pace Sur., 1,000 ft. from S line, 600 ft. from E line of survey	T. D. 1,550 ft.; drlg. shale.
United Prod. Co.'s No. 39 Ray, 1,130 ft. to SE line, 2,396 ft. to SW line of T. Hanson Sur.	Location.

CARTWRIGHT POOL—LIVE OAK COUNTY

Houston Oil Co.'s No. 14 Cartwright, 1,000 ft. W of No. 23 Cartwright	T. D. 2,290 ft.; rigging up to deepen.
Houston Oil Co.'s No. 23 Cartwright, 691 ft. N. 30° E of No. 11	T. D. 3,565 ft.; swabbed 77 bbls. in 2½ hours; going on pump.

(Continued on Page 83)

WILDCAT OPERATIONS IN SOUTHWEST TEXAS

ATASCOSA COUNTY

Company, farm and location—	Remarks:
Glen Mathis, trustee's No. 1 Martin, 150 ft. to NE line, 2,640 ft. to SE line of tract in Jose Antonio Navarro Sur.	T. D. 2,012 ft.; fishing.

BLANCO COUNTY

Hardy-Sitton's No. 1 McMillan	T. D. 696 ft.; fishing.
Liles-Adams et al's No. 1 Stanford, 150 ft. to S line, 1,420 ft. to E line of James Stanford's No. 155	T. D. 970 ft.; standing.
McCleary et al's No. 1 Schenling, 900 ft. to SE line, 600 ft. to S line of J. A. Rouse No. 118 Sur., 4 miles SW from Blanco City	T. D. 574 ft.; shut down.
C. Rosenfield's No. 1 Hohenberger, 800 ft. to W line, 1,260 ft. to N line, Sur. No. 94	T. D. 712 ft.; shut down.

BASTROP COUNTY

Schimmel & Batts' No. 2 Ferguson, 672 ft. W. 17 degrees N of No. 1 Ferguson in J. Doyle Sur.	T. D. 300 ft.; drlg.
Smith & Barnes' No. 1 Marberger, 50 ft. W line, 1,360 ft. S line of tract in King & Millett Sur.	T. D. 415 ft.; drlg.
Texas Dev. Co.'s No. 1 C. H. Ray, 800 ft. from W line and 400 ft. from S line of farm in Thomas Christian Sur.	Derrick.

BELL COUNTY

Mildon Oil Co.'s No. 1 J. K. Edds, Maxiano Moreno Sur.	T. D. 875 ft.; will set csg.
C. O. Alford's No. 1 A. L. Keifer, 150 ft. from S and W lines of tract in Woodford Sur.	Location.
Vilas Oil Co.'s No. 1 B. F. Whittington, 9 miles E of Holland	T. D. 1,298 ft.; shut down.

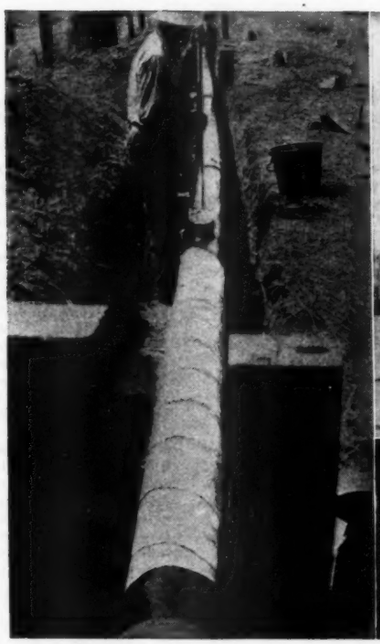
BROOKS COUNTY

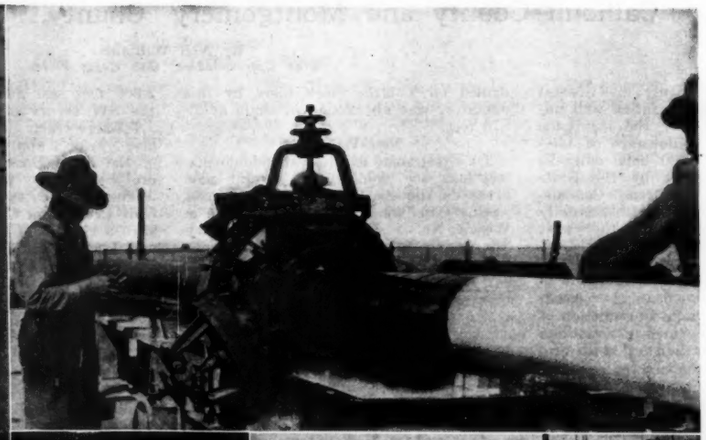
O. C. Woods' No. 1 J. G. Ramos, 959 ft. to E line, 788 ft. to S line of Tract 10, Blk. 3, Amos Dinn Subd., La Lestena grant	T. D. 427 ft.; abnd.
Ike Howeth's No. 1 Singer, 400 ft. E of Humble's No. 1 Singer	T. D. 2,058 ft.; drlg. sand.

BEE COUNTY

Alexander et al's No. 1 McFall, 3 miles S Skidmore	T. D. 1,510 ft.; standing.
Grebin & Woods' No. 1 Riggs, 4,800 ft. to E line, 200 ft. to N line of James Nowland Sur., 6 miles W of Skidmore	T. D. 4,168 ft. in hard sand.
Mauldin et al's No. 1 Kimball, 300 ft. S Grayburg's No. 1-A Kimball, S. Winship Sur.	T. D. 3,544 ft.; fishing.

(Continued on Page 82)





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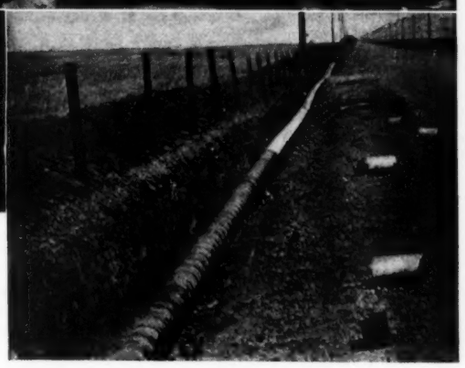

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PABCO Method of PIPE PROTECTION

New Wildcats in Fort Bend and Harris

Two Barbers Hill Deep Tests Swabbing Salt Water. Abandonments in Calhoun County and Montgomery County. Coastal Output Down

By Neil Williams
Staff Correspondent, Gulf Coast Fields

HOUSTON, Tex., July 6.—Coastal production in Texas has fallen well under the maximum allowance of 140,000 bbls. daily as set by the State Railroad Commission with the daily output the past week around 135,000 bbls. At this figure there is a demand for coastal oil production of which now is less than actual requirements for good lubricating oil stock.

Only two producing completions were reported the past week, these being Cranfill-Reynolds Co.'s No. 6 Esperson, at Esperson Field, western Liberty County, and Mills Bennett Production Co.'s No. 4 Gulf Fisher, southeast flank of Barbers Hill. The former was completed early in the year as a small producer in the 2,300-foot horizon but has been deepened to sand and shale at 3,038-49 feet, where, with one joint of 6⅝-inch screen in the sand, it was brought in flowing 312 bbls. of pipe line oil in the first 24 hours on a half-inch choke.

Barbers Hill

The Barbers Hill well was brought in early in the week flowing 740 bbls. of pipe line oil daily on a half-inch choke from sand at a total depth of 3,044 feet. Five joints of 5-inch screen were set. Although not particularly important from a development standpoint this well is something of a freak in that it is producing from the Miocene rather than the Oligocene, the horizon from which all other Barbers Hill wells, except a few shallow ones on the southwest flank are producing. This Miocene is believed to be a small lense which was trapped off under the salt overhang. It was topped at 2,925 feet almost immediately underlying the salt which was at 1,800-2,908 feet. Other tests in that vicinity have not found this sand but have gone into the Oligocene, which has been topped in the highest wells around 4,200 feet.

Two deep wells at Barbers Hill were swabbing salt water at the close of the week. These were Mills Bennett Production Co.'s No. 1 Gulf Fisher, southeast flank, which has been deepened to sand at 5,364 feet from a horizon at 4,754 feet, in which it formerly was completed. The Texas Company's No. 4 Wilburn, a workover on the east flank, also was swabbing about 70 per cent water. In addition to these only nine rigs remain at Barbers Hill but all these tests now are nearing the producing horizons and should be completed within the next three weeks and it is possible no new locations will be made soon.

Calhoun Abandonment

The Texas Company has abandoned its No. 1 Smith, J. Timmons Survey, Calhoun County. This is the second deep test drilled by this company on what is known as the Green Lake geophysical prospect. The test was dry at 6,500 feet. The first test was abandoned at 5,956 feet. No indications of a dome were found in either test. Several sands were found in each but drill stem tests showed salt water. No additional locations have been made on this prospect and in line with the general drilling curtailment on the coast it is likely the rig will be stacked for the time being.

Another wildcat which has been watched closely by scouts was abandoned the past week. This was Lowrie & Young's No. 1 G. J. Sunday, Cyrus Wickerson Survey, Montgomery County, which was dry in shale at 4,755 feet. In Tyler County, Lew Wentz' No. 1 Mann, James Seals Survey, the second test drilled on a large block there by this operator, was abandoned in shale at 2,870 feet.

New Wildcats

To offset some of these abandonments, locations for wildcats in several new areas on the coast were made the past week. Chief among these was Cullen & West's No. 1 Nash, Thomas Alsbury Survey No. 4, southern Fort Bend County. Footage location of this wildcat is 2,600 feet east and 1,240 feet south of the SW corner of Mrs. R. L. Young's 1,483-acre tract. The test is on a favorable prospect approximately 3 miles east of the Nash Dome. It is being rigged up.

These same operators, jointly with Gulf Production Co., made location and have a rig up for their third test in the new Lockwood Field, western Fort Bend County. This test, No. 1 A. P. George, is 300 feet south and 305 feet east out of the NW corner of the 200-acre tract, J. Rabb Survey. It is a south offset to No. 1-A Lockwood, completed the previous week flowing 85 bbls. an hour on a half inch choke from sand at a total depth of 3,476 feet, and which, in turn, is 2,500 feet southwest of the discovery well.

Harris County Test

Givens & Daybault have made location for No. 1 Lobit, Block 19, Lobit Subdivision, David Middleton Survey, north of Addicks, Harris County. Considerable geophysical and geological work was done around Addicks some time ago and the area has been looked upon as favorable. Most of the work, however, has been south of town while this wildcat is just north of town. In Jackson County, Francitas Oil & Land Co. has a derrick up for No. 1 Thrull, P. Green Survey, south of the town of Francitas. This test also is in an area where considerable geophysical work has been done. A possible salt dome or "high" has been indicated in the vicinity.

What is believed by some scouts and geologists to be cap rock has been encountered by Cranfill-Reynolds Co.'s No. 7 Davis, Esperson, western Liberty County. The test, a deep test inside the field, late in the week was drilling in this at 6,198 feet. Esperson, which was discovered by torsion balance in 1928 and on which production was discovered in August, 1929, has been accepted as a deeply seated salt dome but so far no salt or cap has been found to bear out this belief and the findings of the instruments. Several other deep tests have been drilled around the field but the nearest indication of a salt dome has been heaving shale. The field, however, has proved a prolific producer of coastal oil from several shallow as well as deep sands.

Liberty County

Humble Oil & Refining Co. as this is written has failed to make a producer of its No. 7 Sterling at Moss Bluff, Liberty County. The test, which is 350 feet south and 100 feet west of the discovery well, completed as an 800-bbl. well early in 1930, has been swabbing fluid showing salt water but will not flow. Total depth of the sand is 6,355 feet with 36 feet of screen. This well made a small short lived producer in sand at 5,855 feet and was deepened. The discovery well's sand was at 5,666 feet.

Yount Lee Oil Co.'s No. 21 Cade, an extension test at High Island, Galveston County, tested salt water with 22 feet of screen at 4,323 feet but now is being deepened, drilling hard sand and shale at 4,408 feet.

GULF COAST FIELDS AND WILDCATS

Week Ended July 4
All Rotary

BARBERS HILL—CHAMBERS COUNTY

Gulf Prod. Co.'s No. 4 Wilburn (D.D.), Henry Griffith League, 1,400 ft. W line and 50 ft. S line of lease... Total depth 5,290 ft.; trying to sidetrack 4,882 ft.

Humphreys Corp.'s No. 6 E. H. Winfree, W. D. Smith Sur., 50 ft. from N line and 50 ft. from W line of tract ..... Drlg. rock 4,160 ft.

Humphreys Corp.'s No. 1 Fitzgerald-Meadows, Henry Griffith League, 50 ft. S and 100 ft. E of NW cor. of tract ..... Drlg. rock 4,092 ft.

Mills Bennett Prod. Co.'s No. 1 Gulf-Fisher (workover), William Bloodgood Sur., 50 ft. from SW line and 250 ft. from SE line tract ..... Swabbing salt water 5,364 ft.

Mills Bennett Prod. Co.'s No. 4 Gulf-Fisher, Wm. Bloodgood Sur., 300 ft. from W line, 80 ft. from N line tract ..... Set 5 jts. 5-in. screen 3,044 ft.; comp. flowing 1,730 bbls. pipe line oil, 230 lbs. pressure, on ½-in. choke.

Sinclair Oil & Gas Co.'s No. 3 Smith, W. D. Smith Sur., 50 ft. out of S cor. of tract ..... Drlg. sandy lime rock 4,792 ft.

Sun Oil Co.'s No. 2 Smith, W. D. Smith Sur., 75 ft. from W line, 50 ft. from N line of tract ..... Coring sandy shale showing oil 5,160 ft.

Sun Oil Co.'s No. 3 Smith, W. D. Smith Sur., 50 ft. from S line, east offset Yount Lee Oil Co.'s No. 3 Winfree ..... Drlg. sand and shale 5,202 ft.

Sun Oil Co.'s No. 1 Anna Higgins, Wm. Bloodgood Sur., 230 ft. from E line and 31 ft. from S line 10-acre tract ..... Drlg. rock 2,142 ft.

The Texas Company's No. 2 Winfree, west flank, W. D. Smith Sur., 264 ft. N. 50 ft. W at right angles out of SE cor. of lease ..... Total depth 5,622 ft.; reaming.

The Texas Company's No. 4 Wilburn (D.D.), Henry Griffith League, approximately 1,700 ft. from W line and 50 ft. from S line of tract ..... Total depth 5,292 ft.; sidetracked 5,124 ft. to sand 5,188 ft.; swabbing fluid showing 70% salt water.

The Texas Company's No. 6 Wilburn, Henry Griffith League, 250 ft. W of No. 4 and 50 ft. from S line of lease ..... Drlg. sand and shale 4,330 ft.

HUMBLE—HARRIS COUNTY

Rio Bravo Oil Co.'s No. 2 H.E.&W.T., Adams Sur., 250 ft. N along railroad tract from No. 1 and 25 ft. W from center of said tract ..... Total depth 4,742 ft.; drill pipe stuck 3,508 ft.; trying to sidetrack 3,472 ft.

The Texas Company's No. 25 House (D.D.), M. Owen Sur.. Drlg. shale 4,636 ft.

PORT NECHES—ORANGE COUNTY

The Texas Company's No. 1 Polk-Kuhn-Glass, 260 ft. E and 1,545 ft. S of SW cor. Marshall Beaucham Sur., in the T. J. Notgrass Sur. ..... Rig.

The Texas Company's No. 2 Kuhn, 587 ft. S and 150 ft. W of NE cor. of the Mary E. Hall Sur. No. 2 .... Location.

MARKHAM—MATAGORDA COUNTY

E. M. Hamill's No. 1 Meyers, Wm. Hadden Sur., 600 ft. from N line of tract and 200 ft. W of W bank of Tres Palacios Creek ..... Drlg. gumbo and lime 2,610 ft.

HIGH ISLAND—GALVESTON COUNTY

Yount Lee Oil Co.'s No. 21 Cade, Fitzsimmons Sur., 150 ft. W of No. 17 ..... Drlg. hard sand and shale 4,412 ft.

HULL—LIBERTY COUNTY

Sun Oil Co.'s No. 8 Carr (D.D.), Jesse Devore Sur., 50 ft. from W line and 100 ft. from S line of tract ..... No report.

Wenesdan Oil Co.'s No. 1 Palmer, Chas. Underton Sur., 150 ft. from N line and 200 ft. from E line of tract.. No report.

NORTH DAYTON—LIBERTY COUNTY

Harrison-Abercrombie's No. 2 Jones, H.&T.C. Sur. No. 125, 50 ft. from N line and 450 ft. from E line of tract ..... No report.

Victor Oil Co.'s No. 1 Gulf fee (workover)..... Set 45 1/6 ft. 2-in. screen 4,434 ft.; comp. flowing 700 bbls. pipe line oil, ¼-in. choke.

DAMON MOUND—BRAZORIA COUNTY

D. C. Wellock's No. 1 Hamon, John P. Mills Sur., 1,115 ft. NE line and 60 ft. W line Blk. 1 ..... Drlg. shale 660 ft.

ESPERSON—LIBERTY COUNTY

Cranfill-Reynolds Oil Co.'s No. 7 Davis, David Kokernot Sur., 100 ft. S of No. 4 ..... Drlg. rock 6,198 ft.

Cranfill-Reynolds Co.'s No. 6 Esperson (D.D.), C. W. Fisher Sur., 50 ft. from W line and 3,250 ft. from S line of tract ..... Deepened from sand 2,320 ft. to sand and shale 3,038-49 ft.; set 1 jt. 6⅝-in. screen and 2½-in. tubing; comp. flowing 312 bbls. pipe line oil, 200 lbs., ½-in. choke.

Cranfill-Reynolds Oil Co.'s No. 19 Esperson, C. W. Fisher Sur., 400 ft. E No. 9 and 550 ft. N No. 14..... Drlg. shale 3,235 ft.

ORANGE—ORANGE COUNTY

Gulf Prod. Co.'s No. 1 K. Kishi, J. Dyson Sur., 378 ft. from E line and 224 ft. from S line of tract ..... Drlg. sandy shale 4,162 ft.

Jefferson Production Co.'s No. 1 Bland ..... No report.

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BRADFORD PRODUCERS DEAD

BRADFORD, Pa., July 4.—Two veteran oil producers died here on Wednesday.

Felix Steinberger of the firm of Nusbaum & Steinberger, came to this country from Hungary when a boy. He started in the oil country in Pit Hole, later living in Shamburg, Parkers Landing and Petrolia before coming to Bradford. He was not only an oil producer and natural gas distributor, but in his 50 years of business life was a well known figure in mercantile trade, chemical manufacturing and window glass manufacturing. He was 75 years old at the time of his death.

Joseph Roggenbaum, age 67, a native of Germany and for the past 28 years an oil producer in the Sawyer City area had been ill six months. Mr. Roggenbaum had been a farmer and dairy man for many years before going into the oil business.

Bossier Wildcat Attracting Attention

Rhodessa Deep Gas Test Interesting. Activity in Zwolle. Shelby County Busy. Six New Mississippi Operations

By J. R. Crumpton
Staff Correspondent, Louisiana-Arkansas

SHREVEPORT, La., July 6.—There were no outstanding developments in this division in the way of completions; but a persistently watchful, waiting attitude was assumed in several wildcats of note. Of the seven completed wells, four were dry, with two small gas wells and one oil well, all in proven fields. The producer was from the eastern extension of Zwolle, Jordan Drilling Co.'s No. 1 McCormick, Section 2-7-11, flowing 500 bbls. daily through one-half inch choke from 2,412 feet. The gas wells were practically dry hole disappointments, gauging only a minimum flow. The Arkansas-Louisiana Pipe Line Co.'s No. 6 McInnery, Section 28-19-4, Ouachita Parish, gauged less than 4,000,000 feet from 2,185 feet, and Bahan & Bahan's No. 1 Jarmon, Section 27-22-3, in Union Parish, was completed, gauging only 1,023,000 feet of gas from 2,185 feet.

Of the wildcats in North Louisiana, none are creating as much attention as two that are being drilled in northwestern Bossier Parish. The Plain Dealing Oil Corp.'s (formerly Andrews & Devlin) No. 1 Nattin, Section 15-22-14, bailed down 2,000 feet showing considerable oil of 24.5 gravity and a small amount of gas. Ten feet of sand was encountered with total depth 2,882 feet. Operators are splicing bailing line to resume bailing. Another wildcat in this vicinity, 8 miles southeast, is the Flint River Oil Co.'s No. 1 C. L. DeMoss, Section 22-22-13, which cored 18 feet of sandy shale, showing oil from 3,028-46 feet. Arrangements are being made to cement a string of 6-inch casing. The well is one-fourth of a mile east and in the same section as the old Dallas Oil Co.'s No. 1 Scovall & Gaines which was drilled in 1917. The total depth of the Dallas Oil Co.'s well, which flowed from 1,200 to 1,500 bbls. daily for several days, was 2,824 feet, with 400 feet of open hole. The Flint River test cored a quantity of nonproducing sand from 2,608-30 feet, and the operators in that section think the oil from the old test was coming from this depth. The original well was probably producing from the Blossom sand while the present test has pretty well been defined as the Woodbine formation. Anyway, these two wells in the Plain Dealing area should prove within the next two weeks whether it is freak territory or really capable of opening up a new field in Bossier Parish.

LOUISIANA

The only test of interest in Caddo is United Gas Public Service Co.'s No. 1 Smith, Section 33-23-16, in the Rhodessa deep gas district in the northwestern part of the parish, where highly saturated gas is found at 5,500 feet. Nine and five-eighths inch casing was set in this well at 3,593 feet and the bit is now drilling in lime at 4,643 feet. In Claiborne Parish, the Leue Oil Co. is drilling below 3,300 feet on its No. 1 Kinder, Section 2-21-7. This test is 5 miles northeast of the old Homer Field. Four wells are drilling in DeSoto Parish as follows; Ben Merritt's No. 1 Wollums, Section 29-12-12, set 6-inch casing at 2,580 feet with a total depth of 2,657 feet; E. T. Oakes' No. 1 R. H. Bryant, Section 30-13-15, is drilling in chalk rock at 1,978 feet; Rellitt Oil Co.'s No. 1 Gannon heirs, Section 12-11-16, is shut down for fuel at 1,410 feet, and Walter Nicholson, begun May 18, set 10-inch casing at 200 feet and is now drilling at 500 feet on his No. 1 Jim Guy in Section 3-11-13. The Pelican Natural Gas Co.'s No. 2 Chapman, Section 14-16-6, Richland gas field, tested dry at 2,406 feet, and liner was pulled to deepen to 2,430 feet, the depth of the nearest gasser, one-half mile distant. Operators in this field are endeavoring to complete the wells as near the top of the sand as possible as salt water is beginning to show up in those wells that penetrated the sand for considerable depth. The Southern Carbon Co. has started two new wells in this field, its Nos. 4 and 5 Rosengrant & Ducomb, Section 19-17-6, and the latter in Section 24-17-5. The State Line Oil & Gas Co. has set 6-inch at 2,300 feet on its No. 1-A Hildiness, Section 10-16-6, and United Carbon Co. has set 6-inch at 2,285 feet on its No. 2 Cooper in Section 13-16-6.

Zwolle Active

Although drilling operations have slowed down to a minimum in the Zwolle Field of Sabine Parish, it continues to be the most active area with 18 wells drilling and 4 rigging up. Several wells are completed with various amounts of oil in the hole but will not be pumped at the present time due to the low price of crude and the high lifting charges. W. M. Coates' No. 1 Williams, Section 23-7-11, 3 miles southeast of the eastern extension of this field, cored 10 feet of sand with a show of gas from 2,808 feet. A drill stem test will be made at this depth. O. A. Gautier has resumed drilling on his No. 1 Mischell, Section 30-8-12, 1½ miles north of Zwolle Townsite production, and has set 6-inch casing at 2,206 feet. Another wildcat in this territory is R. L. Gay's No. 1-A Long Bell Lumber Co., Section 10-8-13, 7 miles northwest of production at Zwolle. Although it is below the producing horizon of the field, recent showings of gas indicate that another producing horizon may be discovered. The Loring Oil Co. is starting two new tests in the Zwolle area, No. 16 Bowman-Hicks, Section 3-7-12, and No. 17 Bowman-Hicks, in Section 16-7-12. The latter will be a deep test to 6,000 feet. Two other wildcats in North Louisiana are United Gas Public Service Co.'s No. 1 Pioneer Cooperage Co., Section 29-21-9, West Carroll Parish, which is drilling at 3,066 feet, and the Gulf Refining Co.'s No. 1-A Bodcaw Lumber Co., Section 4-10-5, Winn Parish, which is drilling in sand with streaks of rock at 1,960 feet.

The principal developments in the border counties of East Texas were centered in Shelby County. E. L. Chapman's No. 1 Pickering Lumber Co., C. E. Henry Survey, which blew in wild unexpectedly more than a week ago, making 25,000,000 feet of gas, continues to run wild while the crew battles to subdue it. After the boilers were removed to a safe distance, constant attempts have been made to kill the well by pumping heavy mud into the hole, but the drill stem encountered a boulder or other obstruction about 1,200 feet down, and, although the output has been lowered to some extent, it is still far from being under control. With only 400 feet of 12-inch surface casing in the hole, and in bad shape, the operators are fearful that if the flow is stopped through the open hole the gas will break through on the outside of the casing, thus forming a crater.

The new gasser has stimulated activity in that immediate area, operators who already had blocks of acreage procuring protection in various directions from the well. Shelby County also furnished the wildcat disappointment for the week when the Sloan-Tokio Oil Co. (formerly Sloan Prospecting Co.) junked and abandoned its No. 1 Windham, H. English Survey, at 3,399 feet. This well has been watched closely for the past few weeks after making two heads of oil of 7 and 11 minutes duration, four hours apart. The test was made with 4½-inch liner, and in pulling, five joints were left in the hole. The operators decided to set a string of 4½-inch casing and the five joints of liner were sidetracked and casing set at 3,294 feet. The well has since been making enough gas to fire the boilers, and a small amount of oil has been swabbed from the hole through 2-inch tubing. The gas is thought to be coming from between the 4½ and 6-inch casing, the latter being set at 2,622 feet. The

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WILDCAT OPERATIONS IN LOUISIANA-ARKANSAS

(Rotary operations unless otherwise designated)

NORTH LOUISIANA

BIENVILLE PARISH

Company, farm and location—	Remarks:
Arcadia Drilling Co.'s No. 1 Atkins, 175 ft. W, 120 ft. N, SE cor. NW NE, Sec. 27-18-4	Drlg. shale and gumbo 980 ft.

BOSSIER PARISH

Andrews & Devlin's No. 1 Nattin, 100 ft. N, 250 ft. W, C, Sec. 15-22-14	Cmtd. 4½-in. 2,868 ft.
Flint River Oil Co.'s No. 1 C. L. DeMoss, 200 ft. S and E, NW cor. SE NW, Sec. 22-22-13	Arranging to set 6⅝-in. 3,028 ft.
Dr. W. N. Hankins' No. 1 Newell, 300 ft. S and W, NE cor., Sec. 12-19-11	Drlg. 1,185 ft.
D. L. Perkins' No. 1 Ardis & Co., 1,127 ft. N, 198 ft. E, SW cor., Sec. 13-15-11	Set 10-in. 90 ft; S.D.
Rombaugh et al's No. 1 Allison, SW SE, Sec. 10-19-13	S.D. 1,600 ft.

CADDO PARISH

United Gas Public Service Co.'s No. 1 M. K. Smith, 660 ft. S, 2,640 ft. W, NE cor., Sec. 33-23-16	Drlg. lime 4,643 ft.

CALDWELL PARISH

Carter Bell's No. 1 Taylor, 150 ft. S, 150 ft. E, NW cor. NE SE, Sec. 17-14-4	Derrick.
Hudson et al's No. 1 Burton, Sec. 35-13-2e	S.D. 2,950 ft.

CATAHOULA PARISH

National Drlg. Co.'s No. 1 Marsh McMillen, 70 ft. N, 100 ft. W, C, Sec. 26-9-6	T.A. 3,097 ft.

CLAIBORNE PARISH

Leue Oil Co.'s No. 1 Kinder, 154 ft. N, 642 ft. E, SW cor. SE, Sec. 2-21-7	Drlg. 3,300 ft.

DESOTO PARISH

Keatchie O. & G. Co.'s No. 1 Hallie Smith (was H. E. Weichert's), NE SE, Sec. 31-14-15	S.D. 2,350 ft.
S. S. Meek, tr.'s No. 1 Wagner, 300 ft. S and E, NW cor. SE NW, Sec. 5-12-14	Derrick.
Ben Merritt, tr.'s No. 1 Wallums, NE cor. SW SW, Sec. 29-12-12	Set 6-in. csg. 2,580 ft; T.D. 2,657 ft.
E. T. Oakes' No. 1 R. H. Bryant et al, 300 ft. N and W, SE cor. NE NW, Sec. 30-13-15	Drlg. chalk rock 1,978 ft.
Rellitt Oil Co.'s No. 1 Gannon hrs., 300 ft. S and E, NW cor. NW NE, Sec. 12-11-16	S.D. 1,410 ft.
Walters-Nicholson, tr.'s No. 1 Jim Guy, Sec. 3-11-13	Drlg. 500 ft.

NATCHITOCHES PARISH

W. M. Coats' No. 1 Collins, 730 ft. N, 50 ft. E, C, Sec. 28-9-10	T.A. 4,091 ft.
J. W. Cooper et al's No. 1 Cooper, NW SW, Sec. 35-11-10	S.D. 2,156 ft.
Cooper et al's No. 2-A Cooper, C SE SE, Sec. 23-11-10	S.D. 1,518 ft.
C. M. Talley et al's No. 1 C. M. Talley, 1,980 ft. W, 660 ft. S, NE cor. SE, Sec. 29-11-10	Tested dry; S.D. 1,380 ft.

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LOUISIANA-ARKANSAS PROVEN AREAS

NORTH LOUISIANA

CADDO PARISH—PINE ISLAND

Company, farm and location—	Remarks:
J. T. McCormick's No. 1 C. B. Christian, 330 ft. S, 300 ft. W, NE cor. SW, Sec. 27-21-15	S.D. 1,335 ft.
Shreveport Oil Corp.'s No. 2-B Muslow, 1,000 ft. S, 300 ft. E, NW cor., Sec. 32-21-15	Arranging to set perforated csg. 2,135 ft.
Simplex Oil Co.'s No. 1 Youree-Glassell, 500 ft. N and E, C, Sec. 13-20-15	Set 10-in. 150 ft; S.D.

MOREHOUSE PARISH

Bahan & Bahan's No. 4 Feazel, 900 ft. W, 300 ft. S, NE cor., Sec. 2-20-4	Location.

OUACHITA PARISH

Ark.-La. P. L. Co.'s No. 6 McInnery, 700 ft. N and E, SW cor. SW NW, Sec. 28-19-4e	Completed June 25; 4,000,000 ft. gas 2,185 ft.

RICHLAND PARISH

Pelican Nat. Gas Co.'s No. 2 Chapman, 660 ft. N and W, SE cor. SW, Sec. 14-16-6e	Drlg. plug 2,320 ft.
Pelican Nat. Gas Co.'s No. 1 R. H. Alexander, 660 ft. N and W, SE cor., Sec. 4-16-6	Derrick.
State Line O. & G. Co.'s No. 1-A Holdiness, 1,982 ft. E, 760 ft. N, SW cor., Sec. 10-16-6e	Set 6-in. 2,300 ft.
Southern Carbon Co.'s No. 4 Rosengraut & Ducomb, 1,320 ft. S, 660 ft. W, NE cor., Sec. 19-17-6	Began June 27; set 12-in. 194 ft.
Southern Carbon Co.'s No. 5 Rosengraut & Ducomb, 3,300 ft. N, 2,089 ft. W, SE cor., Sec. 24-17-5e	Rigging up.
United Carbon Co.'s No. 2 Cooper, 660 ft. N, 3,551 ft. E, SW cor., Sec. 13-16-6	Set 6-in. 2,285 ft.
United Carbon Co.'s No. 1 Faust Lbr. Co., 1,320 ft. S, 1,980 ft. E, NW cor. SW, Sec. 13-17-5	Rigging up.
United Gas Public Service Co.'s No. 5 Marshfield, 660 ft. N and E, SW cor., Sec. 19-17-6e	Derrick.
United Gas Public Service Co.'s No. 1-A Wayne Land & Timber Co., 1,320 ft. S, 697 ft. E, NW cor., Sec. 24-17-5e	Location.

SABINE PARISH—ZWOLLE

Roy Baker's No. 1 Sabine Lbr. Co., Sec. 1-7-12	Set 6-in. 2,370 ft.
W. M. Coates' No. 1 Hale, NE cor. SW NE, Sec. 1-7-12	Began June 25; set 10-in. 95 ft; drlg. 1,280 ft.
W. M. Coates' No. 1 Williams, NE cor., Sec. 23-7-11	Arranging to make D.S. test 2,808 ft.
Hawkins et al's No. 1 Moran, Sec. 1-7-11	400 ft. oil in hole 2,620 ft; W.O. S.R.
O. A. Gautier et al's No. 1 Mischell, 330 ft. E, 150 ft. N, SW cor. SE NW, Sec. 30-8-12	Set 6-in. 2,206 ft.
Hawkins & Antoon's No. 1 Newton, Sec. 1-7-11	Drlg. 2,550 ft.
Hudson & Bird's No. 1 Walden, 480 ft. N, 300 ft. E, SW cor., SW NE, Sec. 26-8-11	Location.

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Increased Activity in Eastern Colorado

Converse County, Wyoming, Core Hole Has Flow of 1,000,000 Feet of Gas. Osage Field Price Stimulates Development

By Tolbert R. Ingram
Staff Correspondent, Rocky Mountain Area

DENVER, Colo., July 6.—Active drilling wells in New Mexico are down to about a dozen. Leonard & Levers' No. 1 Justis, which extends the Jal Pool to the east, was completed as a 25,000,000-foot gas well.

The Reiter-Foster Oil Co.'s Greasewood Dome test in Colorado, is drawing close to the objective and activity in that area is showing an increase with three locations reported. The South Park Oil & Gas Co.'s test in Park County is believed to be only 50 feet off the Dakota, upsetting former geological calculations. The Government's water well in the Mesa Verde National Park has tested the Dakota and found water of a note very desirable quality.

Wyoming reported a deal for the Bolton Creek pipe line to Casper with plans for putting it into operation. The Phillips Petroleum Co. had a flow of 1,000,000 feet of gas in Converse County in a corehole drilled to work out the geology. The Osage Field is showing an increase in activity and crude prices are holding to 92 cents a barrel. Shooting of wells in the west extension has helped production. The Badger Basin test, deepest in the Rocky Mountains, is through the second Wall Creek. One new operation is reported in Sheridan County and several old wells in various areas have been abandoned. The Kinney-Coastal Co. has made a tentative location for a deep well at Pilot Butte.

The first of the seven wells drilling on the Cut Bank Dome in Montana for a gas supply for Butte and Helena is in with an estimated flow of 20,000,000 feet a day. Several small wells were completed in the Kevin-Sunburst Field.

NEW MEXICO

Of 56 rigs and drilling wells reported in New Mexico for June, not more than 12 are active. The total does not include 6 or 8 wells in the Hobbs, Eunice and other pools which have suspended indefinitely and been removed from the drilling reports until further notice.

Eddy County

J. O. Hammond & Sons' No. 1 Gillette, C NW NW, Section 34-18-26, is shut down at 1,117 feet and preparations are being made to drill deeper. It had a show of black oil at 828-33 feet.

Lea County

Leonard & Levers' No. 1 Justis, C SE NE, Section 19-25-37, Jal area, was completed at a total depth of 2,795 feet and has been connected with the pipe line of the El Paso Natural Gas Co. This well proves up considerable territory for gas and is the only well drilled in the Jal Pool this year. It is located two-thirds of a mile east of the Continental Oil Co.'s No. 1 Sholes which was completed as a gas well in 1929 at 3,030 feet. No. 1 Justis gauged 25,299,000 feet of gas in 24 hours. The elevation is 3,072 feet. It topped the anhydrite at 995 feet and cut the salt beds at 1,175 to 2,595 feet. The top of the brown lime was at 2,615 feet. It had a show of oil at 2,705-13 feet and first show of gas at 2,743-48 feet with an increase at 2,755 feet. At 2,758 feet there was an increase and the tools were blown up the hole. The tools were again lost at 2,795 feet and it was decided to complete at that depth.

Culbertson & Conrad's No. 1 State, C NE, Section 22-18-34, in the Caprock area, is bottomed at 2,700 feet in salt and potash and is fishing for tools.

Western Drilling Co.'s No. 1 State, SE NE NE, Section 16-20-32, northwest of the Lea Pool, is drilling at 2,860 feet in lime. It had 400 feet of sulphur water at 2,745 feet which increased at 2,785-2,800 feet.

Otero County

Pasotero Petroleum Corp.'s No. 1 Evans, NW cor. SW, Section 22-24-12, is shut down at 850 feet in lime to repair rig. It had a show of gas at 375-410 feet and another at 808 feet. There was also a show of oil at 808 feet. The 10-inch is at 695 feet. This is a test of the Pennsylvanian formation.

Santa Fe County

Myers-Owsley Drilling Co.'s No. 1 Cantwell, NW cor., Section 5-10n-9e, near Stanley, is drilling below 115 feet. This is a cable-tool test and contract calls for a minimum depth of 2,500 feet.

Luna County

Angelus Oil & Mining Co.'s No. 3 State, C NW SE, Section 20-21-10w, Deming district, is resuming. It is cleaning out at 6,091 feet and may be drilled to a depth of 8,000 feet. It is not certain whether the hole is bottomed in the Pennsylvanian or Mississippian. It has had several shows of gas in the last 500 feet. The association has 40,000 acres under lease and the operation is financed largely by interests identified with the Pacific Electric Co., of Los Angeles.

R'o Arriba County

Governador Dome Oil Co.'s No. 1, S.E. Section 15-29-7w, is drilling at 1,205 feet and had a small show of oil at 1,205 feet. It has the Picture Cliff as the objective.

Guadalupe County

New Mexico Producing & Refining Co., Ltd.'s No. 1 McMullen, SW cor., Section 24-5n-16, Mesa Leon district, is drilling at 1,010 feet in red sand and shale. It had water at 870-75 feet and 999-1,000 feet.

San Juan County

Continental Oil Co.'s No. 24, SW NW SW, Section 1-29-19, Rattlesnake Dome, is drilling by at 4,194 feet. Total depth was 4,730 feet when the drill pipe stuck last January.

Valencia County

Thomas B. Harlan and others' No. 4 Harlan Ranch, NW NE NW, Section 5-6n-2e, De Chavez district, is drilling with rotary at 2,400 feet in river wash. The contract calls for a 3,800-foot hole.

COLORADO

Weld County

Reiter-Foster Oil Co.'s No. 1 Ida Johnson, C NE NW, Section 24-6n-61, Greasewood Dome, one-fourth of a mile to the north and west of the discovery well, is drilling at 6,015 feet. This is a joint operation with the Platte Valley Petroleum Corp., which drilled in the discovery well. Interest in this well, which will be carried deeper than the discovery well and yield the first definite information on the formations below the producing horizon opened up, is increasing as the hole nears the pay. It is becoming increasingly apparent that promotors will be ready for developments within the next few weeks in the Ida Johnson well and that the eastern Colorado fields are to be exploited by a number of companies depending upon public interest to finance their undertakings. The Ida Johnson well will be drilled with rotary bit to around 6,250 feet, where a lime shell is expected that will make a suitable place to land and cement the string of 9⅝-inch pipe. Change over to cable tools will be made at this depth. The 7-inch, which will be run to the top of the sand expected at 6,600-700 feet, is now at Orchard and is being trucked to location.

George A. Vincent and others have dug a cellar in the C NW NW, Section 25-6n-61, on the Mrs. G. C. Gabois tract, three-fourths of a mile to the southwest of the discovery well. The lease is held by C. D. Cunningham. The Tulsa-Fort Morgan Oil Co., of which Ralph C. Drennan, secretary of the Fort Morgan Chamber of Commerce, is president, has announced its intentions of drilling on the Emil Smith tract in Section 18-6n-61, comprising the NE N half SW and NW SE of the section. It is northeast of the discovery. A. C. Grandbouche, trustee for the Independent Oil & Refining Co., has dug a cellar on the William Schmidt tract in the SE of Section 18-6n-61. The company says it is planned to complete purchase of refinery site at Orchard, right of way from the field to that point, leases, engineering work and incorporation expenses.

Morgan County

Indian Territory Illuminating Oil Co.'s No. 1 State, C NE NE, Section 16-1n-57, Fort Morgan anticline, is bottomed at 4,090 feet and shut down waiting for cement plug to set. At this depth it has changed over from cable to rotary tools. The 8¼-inch is at 3,650 feet and the hole, which was caving badly, is open below that depth following the pulling of 6¼-inch which could not be landed on bottom. This well is on a magnetometer high, while the Greasewood discovery well, 25 miles to the northwest, is on a magnetometer low.

Badger Creek Oil & Gas Co.'s No. 1 Kent, SW cor., Section 2-2n-57, Badger Creek Dome, which has been shut down at 750 feet for two years, has completed a water well in anticipation of resuming operations. Last month a deal was made with J. Juhan to start work within 90 days and the company's leases on 5,550 acres were placed in escrow under same. W. T. Johnson, a director in the Platte Valley Petroleum Corp., is said to be interested.

Lincoln County

Eastern Colorado Oil Co.'s No. 1 State, SE cor. NW, Section 36-14-57, Hugo district, is underreaming and lowering 4¾-inch close to bottom at 3,380 feet. The hole has a little oil standing in it which accumulated at the bottom since the well was shut down more than a year ago. It is believed to be 100 to 200 feet off the Dakota.

Adams County

Nettie M. Slatt's No. 1 Hills, SE cor., Section 27-3s-64, Watkins district, is bottomed at 3,660 feet, having made no new hole the past week.

Arapahoe County

MacDeb Drilling Co.'s No. 1 Fitzsimmons, C S half NE, Section 7-4s-66, near Aurora, is bottomed at 5,835 feet and cleaning out preliminary to running 4½-inch. At this depth it was reported in the top of an unidentified sand showing a little oil and gas.

Jefferson County

Ruby Hill Oil & Gas Co.'s No. 1 Braden, SE cor., Section 24-4s-69, near Denver, is shut down at 3,920 feet.

Pueblo County

Anchor Oil Co.'s No. 1 Esely, NE SW SW, Section 35-22s-67, Turtle Butte district, is drilling at 670 feet. It had a show of noninflammable gas at 350-70 feet in the upper Morrison and the hole is being carried down to the level of the Sundance.

Fremont County

Waterville Oil Co.'s No. 1 State, SE cor. NW, Section 16-18s-69, Phantom Canon, north of the Florence Field, is drilling at 1,710 feet.

Park County

South Park Oil & Gas Co.'s No. 1 Esche, SE cor. NW, Section 5-9s-76, Muleshoe Dome, is bottomed at 2,370 feet in black shale and light gray sand to run 8¼-inch. There has been considerable difference of opinion as to the horizon in which the well is drilling. D. A. Knight, who mapped the structure for the company, is quoted as saying the hole is close to or in the top of the Dakota formation. Samples of cuttings were submitted the past week to a prominent local consulting geologist. They were examined under a hand lens and he reached the conclusion that the dark shale cut at 2,305-60 feet belonged to the Graneros shale which occurs just

MICHIGAN OPERATORS MORE CAREFUL TO AVOID REPETITION OF MUSKEGON

By George A. Whitney

MIDLAND, Mich., June 4.—No completions were reported for the week from any section of the Michigan territory, although a number of wells in various counties are drilling in hopes of landing something worth while and a vast amount of wildcatting is being done in many of the counties. Part of these tests are for gas and others for oil, although gas is by far the best proposition at this time. Operators are using very good judgment in their operations, much more so than when the Muskegon Field was first opened and the wells allowed to flow their oil with a good gas pressure back of it, the result being that the oil was taken out just as fast as the gas could raise it. Had these wells been put on pump at once after being drilled in they would have still been nice producers, instead of being abandoned. More care is now taken in handling the wells than was the case in the early days of the development. The low price of oil has had much to do with the quietude that prevails over the field, and the landowners are working along with the operators.

An innovation in the Mount Pleasant-Midland Field was announced at Midland in the information that Noah Skinner, the holder of leases in Greendale Township, Midland County, upon which one new producing well has recently been brought in, and upon which No. 2 is now drilled past the 3,000-foot level, has agreed with the operator that he will not force the offsets which his lease demands, until such time as the price of crude oil advances to $1 or more per barrel.

The Gordon Oil Co.'s No. 1 Skinner is now making a daily production of 238 bbls., and No. 2 had reached a total depth of slightly below 3,000 feet, with the Berea sand showing at 2,393 feet and the Traverse formation at 2,900 feet.

Webster Hardy is drilling a test for gas on his farm, in Augusta Township, Washtenaw County, in southeastern Michigan, across the road from the gas well on the Howell farm.

The test well on the D.O.H.I. Oil Corp., under the management of C. E. Daugherty, on the William Ferrow 40 acres, SE NE, Section 13, Riga Township, Lenawee County, about 15 miles northwest of Toledo, and about 4 miles northwest of Sylvania, had a nice gas showing, with a light oil showing at a shallow depth of 341 feet, indicating that a commercial well may develop as the showings were in the Bedford-Antrim formation, so well known in Michigan.

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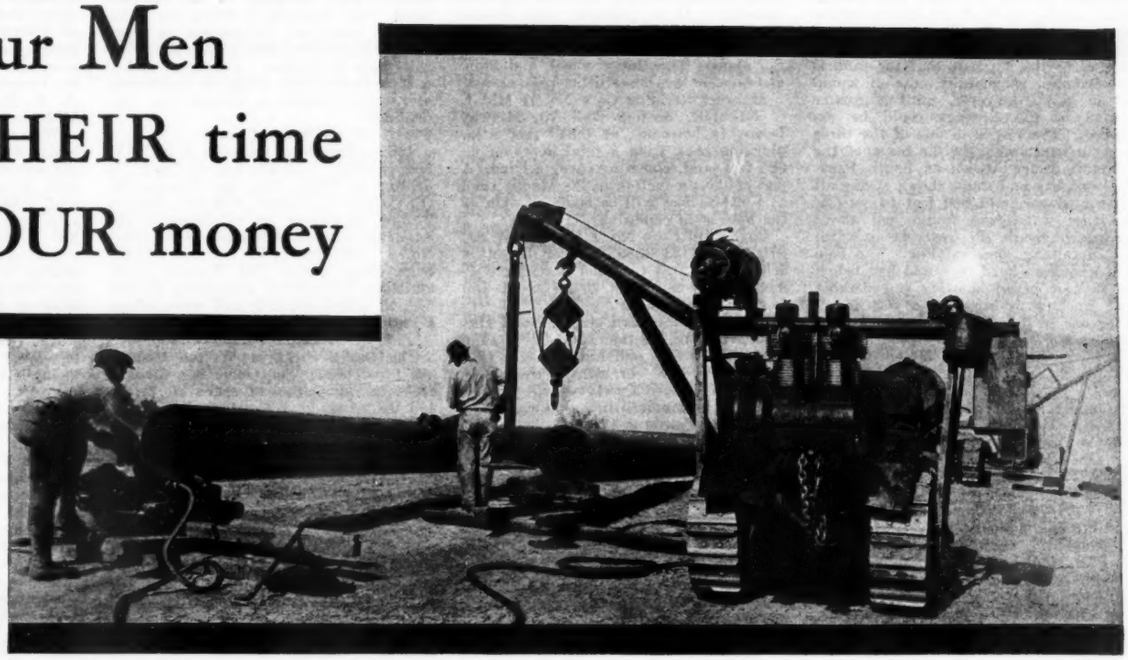
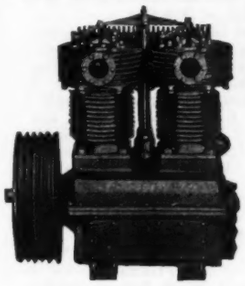


Davey "Air-Cooled" Compressor on "Caterpillar" Tractor operating air motor to rotate pipe while coating is applied. Practically doubles the daily output of the coating crew. (Note the air winch used for "spotting" and handling pipe.)



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above the Dakota group of sands. It was then submitted to another geologist for a microscopic examination. He said definitely that the samples are not Niobrara. The sand, he said, is coarser than usually found in the sands of the Pierre section and this fact, combined with the general characteristics of the shale, and the presence of pyrite, suggests that the sand is the Dakota. A definite opinion would not be given, however, until a greater section of the cuttings could be examined. The test is in one of the three large natural basins in the heart of the mountain range known as South Park. The well has had small shows of gas all the way down from 800 feet to bottom. The first water was found just above the present depth, the water being warm and containing some sulphur. The hole then went into hard rock and just below the rock it began showing considerable gas. The test is becoming a very interesting one as it is upsetting some former opinions and there are very good reasons to believe that the next 50 or 60 feet will put it into a sand of the Dakota series.

In another part of the county, near Jefferson, the South Park Oil Co., an entirely separate organization and in no way identified with the other, is shut down at 2,065 feet to run casing in its No. 1 Mililgan, NE cor. SE, Section 13-8s-76. This well has not shown up so favorably and probably is in a syncline. The company is planning to drill another well 2 to 3 miles to the north.

Archuleta County

Standard Oil Co. of Colorado's No. 1 Fitzhugh, NW SE SW, Section 34-33n-1e, Chromo Dome, is drilling after being shut down for the winter at 502 feet.

Rio Blanco County

Magnolia Petroleum Co.'s No. 1 Maddock, C NW SE, Section 9-2s-96, Piceance Creek, is drilling at 410 feet, and California Co.'s No. 1 California-Raven, NW SE, Section 30-2n-102, Rangely Dome, a rotary test to the Pennsylvanian, is drilling at 480 feet.

Montezuma County

The well which the National Park Service, of the Department of the Interior, is drilling 1¼ miles north of park headquarters in the Mesa Verde National Park, encountered water at 830 feet in shale. This water is believed to be fit for drinking and culinary use and it is estimated a flow of 13,500 gallons per day would be possible from this supply. Drilling was continued to the extent of funds available and terminated at a depth of 3,535 feet. Water of a less desirable quality was struck also in the Dakota formation at 3,352 feet, and rose 1,800 feet in the hole. This water was considered unfit for human consumption. The objective of this well was to continue through the McElmo formation and possibly into the next strata of the Navajo sands and it is hoped a deficiency appropriation will be made to permit the resumption of drilling this winter. The Dakota sand, very hard shells and caprock, was cut at 3,352-3,432 feet.

Moffat County

Representatives of the Continental Oil Co. have been reported testing three gas wells on the Morapas, or Thornburg Dome, south of the Iles Pool, but for what purpose is not disclosed. The wells were drilled several years ago by the Marland Oil Co. A half interest in one of the leases was held by the Union Oil Co. of California. The Continental company acquired the Union company's holdings, and through the merger with the Marland company, now has full ownership. The wells have an open flow capacity of as high as 40,000,000 feet a day. The tests are said to have shown that the pressure continues to hold up to around 700 pounds.

WYOMING

Natrona County

Michael C. Weisman and associates, who recently formed the Lakota Oil & Gas Co., have contracted for the purchase of the 32-mile 6-inch pipe line from the Bolton Creek Field, southwestern Natrona County, to Casper, and also the land holdings and wells in that field. The properties are being acquired from the Bolton Creek Oil Co. and the Iowa-Wyoming Oil Co., both of which are controlled by the Kinney-Coastal Oil Co. The Weisman interests have some black oil production in the North Casper Field and recently drilled a well in the Big Muddy. It is stated that the various properties will be the nucleus for a company to engage in all branches of the oil industry. It is probable that several small wells on the Spindletop Dome, southwest of Casper, will be included in the plans. The Bolton Creek and Spindletop wells are shut in at present.

Midwest Refining Co.'s No. 11 Middy, C NE NE, Section 23-35-79, Midway Dome, is bottomed at 5,940 feet after plugging back from a total depth of 6,685 feet, and cementing cavey ground. A test of the production in the Muddy sand at 5,920-35 feet will be made as soon as the hole is in condition.

Cuyler Oil Co.'s No. 1 Heery, SW SE SE, Section 23-36-85, Powder River, is drilling at 1,915 feet and carrying 6⅝-inch. It is estimated to be about 150 feet above the Muddy.

Roy C. Tarrant and others' No. 1 Hagood, NE NW, Section 25-31-82, is shut down at 510 feet, and Lakota Oil & Gas Co.'s No. 5, NW cor. SE, Section 1-36-82, North Casper Creek, which will be a test to the Madison lime, has rig up.

Converse County

Phillips Petroleum Co.'s core drill test on the NE, Section 27-32-69, encountered a flow of 1,000,000 feet of gas at 360 feet, supposedly coming through a fissue. It was cased off and drilling continued. On this same section last year another core hole encountered 1,000,000 feet of gas at 700 feet in the top of the Cretaceous beds, probably in the Shannon sand. The company is coring the structure to work out the geology in detail and is expected to drill a deep test when this work is finished. Last year it had a crew in the field using the magnetometer, after which it started the core drilling.

Niobrara County

Indian Petroleum Co.'s No. 1, NE NW NE, Section 7-35-65, Lance Creek, is drilling at 3,967 feet, and Continental Oil Co.'s No. 2 Rohlff, NW cor., Section 2-35-65, is rigging up to deepen to the Sundance. Bower-Satterfield Syndicate's No. 1, NE cor. NW, Section 7-35-62, Sage Creek Dome, Old Woman Creek anticline, is reported abandoned at 950 feet, at which depth it had water about a year ago.

Weston County

The Osage Field in Weston County has fared better than some less favored areas in the matter of crude oil prices and as a result operations have continued steadily, though on a somewhat reduced scale. The pipe line runs average better than 1,000 bbls. per day and the field price of crude, which is posted by the Arro Oil & Refining Co., of Lewistown, Mont., is 98 cents per barrel with no limit on the quantity it will take at that price.

The Yellowstone Oil & Refining Co. has been incorporated under the laws of South Dakota with an authorized capital of $500,000 by several interests having production in the Osage Field. Its headquarters will be at Lead, S. Dak., and the incorporators are John Bartolero and R. F. Tackabury, of Lead and H. P. Myer and Hugh Updike, of Osage.

Wytex Oil Co.'s No. 5 Logan McCullough, SW NE NE, Section 23-46-64, in the western extension of the field, which came in two weeks ago for 100 bbls. natural, made 160 bbls. the first 24 hours after being shot. West Osage Oil Co.'s No. 1, SE NE NE, Section 15-46-64, which swabbed 26 bbls. in 24 hours, is making 40 bbls. per day on the pump after being shot. The results show that shooting has helped production in the west extension, although this has not proven true of wells shot in the old field. The West Osage well extended the producing area more than half a mile to the west.

Lambie Oil Co.'s No. 7 Bock, SE cor. NW, Section 14-46-54, is drilling at 1,260 feet, and Chadron-Osage Oil Co.'s No. 13, NE cor. SW, Section 14-46-64, set 8¼-inch at 1,300 feet and is waiting. Yellowstone Petroleum Co.'s No. 1 Lundberg, NE NW NW, Section 27-46-64, is rigging up, and Leithart and others' No. 5, NE NW SE, Section 13-46-64, is running 8¼-inch at 900 feet.

Outside of the Osage district, Gose Oil Syndicate's No. 1, NE cor., Section 28-47-63, Soda Creek Dome, is drilling at 4,918 feet, having resumed recently. This well has been drilling at intervals for more than five years. A year ago it was reported having a show of oil at 4,862 feet. Julius Peters and others' No. 1 Witzell, SE cor. NW, Section 30-46-64, Fiddler Creek, is reconditioning hole at 1,600 feet preliminary to deepening to the Muddy sand at 3,300 feet.

Big Horn County

Ohio Oil Co.'s No. 1 Smith, NE SE SE, Section 33-56-97, Garland Dome, was completed at 1,707-28 feet in the Frontier as a gas well and gauged 20,000,000 feet in 24 hours.

Portland Association, Inc.'s No. 1, SE NE SE, Section 29-56-97 (F. T. Griffith, trustee), is bottomed at 3,715 feet and fishing for tools. It had about 40,000,000 feet of gas per day in the top of the Embar and is being continued to the Madison lime.

Utah Southern Oil Co.'s No. 3 Government, NE cor. SW, Section 29-56-97, is drilling and coring at 3,988 feet in the Madison. From 3,924 feet to bottom the core has shown saturation. It is being drilled with a rotary.

Washakie County

Ohio Oil Co.'s No. 1 Strothers, SW SE NW, Section 19-45-92, Neiber Dome, is drilling at 6,145 feet and is within a few hundred feet of the depth at which the Frontier is expected.

Park County

Resolute Oil Co.'s No. 1, NE SW NE, Section 17-57-101, Badger Basin, is reported drilling at 8,660 feet and to have penetrated the second Frontier sand. It is now in shale and is drilling a little deeper to be sure that it is entirely through the sand. The first and second sands were each about 100 feet thick. While the well has had considerable oil, the results have been somewhat disappointing. It flows by heads about each 18 hours, making around 35 bbls. at each head, or 50 bbls. daily. It begins to head when the oil rises about 6,500 feet in the hole and it is doubtful if it will make more than 50 bbls. per day when tubed. The hole has been reduced to such an extent it is doubtful if the Dakota could be reached. This is the record well for depth in the Rocky Mountain states.

Midwest Refining Co.'s No. 24 Rosenberg, NE SE NE, Section 26-58-98, Frannie Dome, is drilling at 1,460 feet in hard white sand, and Yellowstone Petroleum Co.'s No. 1, NW NE SE, Section 7-57-97, Sage Creek, is standing at 4,080 feet.

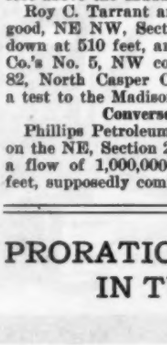
Cody Petroleum Co.'s No. 1-X Danker, SW cor., Section 22-57-98, is reported abandoned at 200 feet. The first hole was drilled to 3,340 feet at which depth

(Continued on Page 98)

PRORATION TO BECOME EFFECTIVE IN TURNER VALLEY IMMEDIATELY

By Victor Laurkston.
Staff Correspondent, Canadian Fields

CHATHAM, Ontario, July 4.—Official figures of the Alberta government covering all oil production in the province for May show a substantial increase over May, 1930. Production from all fields for May, 1931, aggregated 145,633 bbls., compared with 95,227 bbls. a year ago.



Turner Valley crude naphtha production for May, 1931, was given as 135,882 bbls., with 1,779 bbls. of light crude oil. These figures indicate a considerable excess over pipe line deliveries, which amounted to 118,614 bbls. all told. The difference of 19,047 bbls. represents chiefly direct sales at the wells.

Production of light crude from the Red Coulee Field for May was 6,485 bbls., compared with 6,800 bbls. in April. Wainwright heavy crude was 1,225 bbls. and Ribstone heavy crude 262 bbls., these figures showing only slight variations from the preceding months. Production from the entire province for the first five months of 1931 aggregated 751,393 bbls.

Proration Becomes Effective

Turner Valley oil operators were last week notified by the Alberta government that open flows of all wells must be cut down to 40 per cent immediately as a gas conservation measure. It is difficult to determine the full effect of the new regulation on crude naphtha recovery till curtailment has been in progress for some time. Under existing conditions Turner Valley producers have been holding down the flow of their wells to from 50 to 75 per cent of open flow, and it is stated that no well in the field has been producing from full open flow, nor, on the other hand, has any well been cut down to the 40 per cent basis.

In the cases of some of the operating companies objection has been taken to the regulation on the ground that wells are not in shape to apply the heavy back pressure requisite to reduce the gas output to 40 per cent of open flow. It is felt, too, that crude naphtha recovery from some of the smaller wells will be cut to a point where they will be forced to discontinue. Representations have been made to the government in favor of making exceptions in such cases, but a definite statement has been made by R. G. Reid, provincial minister of mines, that no exceptions would be made in enforcing the regulations. "All wells in Turner Valley are required to be operated in accordance with the government regulations," stated Mr. Reid, "and all will fare alike. Notice has been sent to operators that steps must be taken at once to curtail gas flows."

At last reports the advisory committee of oil operators had practically completed its work on the revision of the new oil and gas regulations; which will be promulgated early this month.

Gas Marketing Project

Further progress has been made with the project for organizing a gas marketing company to handle the residual gas production of independent companies in the Turner Valley Field. The project was launched under the auspices of the independent gas producers section of the Oil and Gas Association of Alberta. The proposed company will act as sales agent in disposing of the gas production. A special committee comprising W. C. Fisher, Eric Harvey and H. S. Price has prepared a draft agreement between the proposed marketing company and the producers; and it is understood that at least eight companies controlling an aggregate of 100,000,000 feet a day have tentatively agreed to the plan. Utilization of this Turner Valley production as an emergency supply for some of the major Montana pipe line enterprises is regarded as possible, while efforts may also be made to secure markets in Saskatchewan.

Border Fields

In the Border areas of southern Alberta, Hudson's Bay Oil & Gas Co.'s No. 1 Keho, LSD 2, Section 17-11-22w4, is approaching an interesting stage. This test is preparing to resume after cementing at 4,230 feet with 10-inch pipe carried to 4,219. At this depth the drill is believed to have entered the top of the Blairmore-Kootenay series, after drilling through the Benton formation in which strong shows of high grade crude oil were encountered at 3,680 and 3,776 feet. The crude in these sands was around 34 Baume, with reported production from the two sands around 60 bbls. a day, but was cased off to permit deeper drilling. Oil at this depth was not looked for, and the Blairmore horizon is understood to have been one of the original objectives. It is thought that commercial production may be secured by 1,000 feet or less of drilling in the Blairmore-Kootenay. It is understood

(Continued on Page 84)

New Crisis in California Restriction

Effort to Reduce Production to Allowable Seems Almost Hopeless Task. Revival of Gasoline Price War Indicated

By L. P. Stockman
Staff Correspondent, California Fields

LOS ANGELES, Calif., July 6.—Another week has passed without any additional progress being made toward reducing state production to the allowable maximum of 487,500 bbls. per day, and it begins to look like almost a hopeless task. More than a month has expired since operators ratified the proposal to restrict production to economic requirements, and, although a curtailment of approximately 25,000 bbls. per day has been effected during this period, the objective is not yet in sight. State production is still well in excess of 500,000 bbls. per day and there does not seem much possibility of reducing it much below the 500,000-bbl. mark. The refined oil market registered a definite decided weakening during the past week and the retail market, reflecting a softening in wholesale prices, is unusually spotty. Major companies have been obliged to restore the "competitive price" signs with the result that gasoline made by major refiners is selling all the way from 12½ cents per gallon up to the theoretically stabilized quotation of 16 cents per gallon, tax paid. This is exactly the situation which precipitated the recent gasoline price war on February 28 and which was ostensibly brought to a close on June 19, 1931. It is the opinion of those in close touch with the situation that prices of crude and refined oils will break again later this year if existing unfavorable conditions continue unabated.

Santa Fe Springs, Playa Del Rey and Kettleman Hills continue to be disturbing factors in the production situation and the failure of operators in these fields to restrict production has prevented the state production from being curtailed to the maximum allowable. Santa Fe Springs has been a chronic offender and late this week was still producing 62,015 bbls. per day, compared with an allotted maximum of 55,000 bbls. daily. The umpire's figures for the month of June show that the Richfield Oil Co. effected practically no curtailment whatever. The Star Bell Syndicate, comprising the Bellview Syndicate and Twin Bell Syndicate, produced to the maximum and made no pretense of curtailing. The Wilshire Oil Co. likewise refrained from effecting any curtailment of production. The Texas Company produced 39,234 bbls. in excess of its allotted production at Santa Fe Springs during June.

Elwood in Line

Operators in the Elwood Field of Santa Barbara County have wisely restricted current production and for several days during the past week actually produced less than the allotted maximum. From June 13 to June 30, inclusive, production of the Elwood Field was 1,410 bbls. below the fixed allotment for this period. Kettleman Hills, which has consistently exceeded its established maximum of 60,000 bbls. per day for the past two weeks, registered an additional increase in production late this week due to the completion of the Union Oil Co.'s No. 1 Amerada King which was turned into the flow tanks at 3:30 p. m., July 2. This field will give operators something to think about during the course of the next few months unless something is done to reduce production. Operators in other California fields should give serious thought to the menace presented by Kettleman Hills because if they break the curtailment program through failure to restrict production Kettleman Hills flowing wide open would work to the disadvantage of other fields through a breakdown in the existing price structures. Kettleman Hills at the present time is capable of producing approximately 125,000 bbls. per day but this potential is expected to be substantially increased by the completion of several more wells in the near future. In sending out individual allotments for the month of July, Umpire Paul Grimm warned operators that "success of the curtailment program depends upon the strict limitation of production to the amounts specified as the July allotment. Failure of the curtailment program will result in demoralization."

An announcement was made a few days ago that the First Securities Co. had disposed of its portion of the $10,000,000 first mortgage bonds of the Sunset Pacific Oil Co., formerly Julian Petroleum Corp., which it had acquired at the time the bonds were issued early in 1929. The significance which attaches to this announcement lies in the fact that control of the Sunset Pacific has passed to some other company. The First Securities announced that the bonds, which are now in default, had been purchased by one of the larger oil companies.

Against Price Wars

The attempt on the part of Los Angeles business men to discourage patronage of service stations selling gasoline at cut-rate prices gained considerable support during the past 10 days but it remains to be seen whether this moral support will be reflected in the sale of cheap gasoline. The board of supervisors of Los Angeles County went on record July 1, 1931, in favor of the movement recently launched to educate the public on stabilization of the oil industry as a means of relieving unemployment in California. Following a conference with H. C. Fremming, director of the county bureau of employment stabilization, and James R. Martin, a representative of the business men's committee, the board adopted a resolution that "the oil industry is the largest basic industry of the State of California and whereas the board of supervisors of Los Angeles County recognizes that in California as a whole and Los Angeles city and county in particular, all phases of business and labor are vitally affected by the ability of the oil industry to operate at a reasonable margin of profit. Now, therefore, be it resolved that the board of supervisors of Los Angeles County does approve the effort of stabilization being made by the oil industry in California and strongly urges the people of this county to adopt a policy of encouraging normal conditions in the oil industry which in turn will be helpful to all other industries."

New Field

The Barnsdall Oil Co. discovered another new oil field in California when its No. 1 Tognazzini at Gato Ridge in Santa Barbara County built up to 1,100 bbls. per day after its completion as a 200-bbl. pumper. The Barnsdall's new field is in the Los Alamos region of Santa Barbara County where heavy gravity oil has been produced for a number of years. No. 1 Tognazzini, however, is several miles from production and the completion of this well, located on a normal anticline, will increase the Barnsdall's reserve. No further development is anticipated for the present as the oil from this well, testing 16.2° in gravity, does not warrant additional development under existing conditions. The Barnsdall is developing this area in conjunction with the Rio Grande Oil Co. on a 50-50 basis similar to the deal covering production and development activities at Elwood, which these companies also discovered. The Golconda Petroleum, Continental, Texas and Western Gulf may each drill one well in the Gato Ridge district, although it is quite likely drilling will be delayed as long as possible, especially since the Barnsdall shut in No. 1 Tognazzini subsequent to completion.

Kettleman Hills

The Union Oil Co. successfully completed its No. 1 Amerada King in the North Dome of Kettleman Hills Thursday, July 2, 1931, when it blew in following one run of the swab. It was completed flowing at the rate of 18,000 bbls. per day but was beaned back shortly after completion to 10,000 bbls. daily. The Union's new well, which is being drilled in conjunction with the Amerada Petroleum, offsets the Superior Oil Co.'s No. 1 Huffman, flowing 10,550 bbls. per day from 8,323 feet. No. 1 Amerada King was bottomed at 8,310 feet and finished with a 6⅝-inch liner and a 9⅝-inch water string landed and cemented at 6,978 feet. This is the first completion on the 160-acre King lease, for which the Union paid $4,000,000 in cash and $4,000,000 out of production for a 50 per cent undivided interest. The Union has not yet made any further plans with respect to additional development on the King lease but will undoubtedly start a new hole to offset the Superior's No. 2 Huffman, and may also undertake additional necessary offsetting.

The Kettleman North Dome Association also completed a new well at Kettleman Hills during the past week when No. 8-28J was brought in flowing 8,740 bbls. of clean 38.3 gravity oil from 8,050 feet. This new well is flowing through four 1-inch beans under a pressure of 1,160 pounds on the casing and 670 pounds on the tubing. The association has just abopt completed rigging up No. 88-2 P, the Milham Exploration Co.'s discovery well, preparatory to killing it in conformity with the announced decision of shutting it in indefinitely if the hole cannot be redrilled and deepened to the Ochsner zone. No. 1-12 P, another well of the association which is showing an excessively high gas-oil ratio, is also scheduled to be taken off production in the near future and carried down to the deep zone. The Kettleman North Dome Association will probably complete No. 23-1 P some time during the coming week as this well is being rigged up to drill out the cement. No. 8-6 Q is also expected to be finished in the near future. The Shell Oil Co. has concluded running 6⅝-inch oil string in No. 1 Dixon, located out on the north flank, and this project, bottomed at 8,807 feet, is expected to be given a production test within the next few days. No. 2 Whepley of the Associated at 8,150 feet and the North American's No. 1 Blauvelt should also be given production tests in the near future.

Lost Hills-Belridge

There were no developments of unusual interest in the Lost Hills-Belridge Fields of Kern County during the past week due to the wet jobs encountered by the Universal Oil Co. and the Getty Oil Co. at Lost Hills and the delay experienced by the Continental in recompleting No. 2 Result at Belridge which came in last week flowing at the rate of 1,500 bbls. per day. The Continental is cleaning out No. 2 Result and this well should be ready for final production test during the coming week. The Reward Oil Co.'s No. 4, a recent completion in the North Belridge Field, has been beaned down to 2,075 bbls. per day, the oil testing 39.7° and showing a cut of less than 1 per cent. The Belridge Oil Co. has resumed drilling on No. 64 in Section 27-27-20 in the North Belridge Field and this well, the highest structurally in the field, will be listed for early completion. No. 8 in Section 35-27-20 is expected to be tanking oil some time soon. At Lost Hills, both the Universal and Getty Oil Co. have resumed drilling operations in their respective tests following the inability to shut off water last week.

The Standard Oil Co. is conducting a conclusive pumping test on No. 1 Alferitz in the Devils Den section of Kern County after plugging back from 3,206 feet to 2,674 feet. This well, a wildcat drilled on acreage subleased from the Richfield Oil Co., is pumping 55 bbls. of 19.5 gravity oil cutting 31 per cent water. It is quite probable that the Standard will drill another test on the Devils Den anti-

TANKER SHIPMENTS FROM LOS ANGELES TO ATLANTIC AND GULF COAST PORTS

Commodity—	Total this week	Daily average	Total last week	Daily average	This year to date	Same time last year
Crude oil	.....	.....	.....	.....	.....	68,850
Fuel oil	.....	.....	.....	.....	.....	71,950
Diesel and gas oil	95,122	13,589	.....	.....	987,352	1,919,152
Gasoline	427,176	61,025	516,975	73,854	7,591,901	9,140,266
Kerosene	.....	.....	47,597	6,800	89,109	.....
Coastwise—						
Crude oil	293,406	41,915	500,560	71,509	10,659,350	7,704,806
Fuel oil	471,601	67,372	172,283	24,612	6,907,450	8,552,345
Diesel and gas oil	34,112	4,873	16,459	2,351	805,928	1,005,612
Gasoline	294,302	42,043	359,826	51,404	6,737,362	5,930,300
Kerosene	17,278	2,611	5,007	715	186,727	96,822
Naphtha distillate	.....	.....	.....	.....	4,952	.....
Exports—						
Crude oil	75,089	10,727	165,445	23,635	3,520,030	3,265,598
Fuel oil	418,615	59,802	231,744	33,106	7,537,370	9,412,266
Diesel and gas oil	82,681	11,812	.....	.....	1,906,931	2,330,687
Gasoline	160,104	22,872	.....	.....	4,606,759	3,042,154
Kerosene	16,754	2,393	.....	.....	801,210	2,046,931
Lubricants	.....	.....	.....	.....	18,978	10,082

TANKER SHIPMENTS FROM SAN FRANCISCO TO ATLANTIC AND GULF PORTS

Diesel and gas oil	.....	.....	.....	.....	.....	88,280
Gasoline	.....	.....	.....	.....	405,469	641,680
Lubricants	.....	.....	.....	.....	21,990	5,866
Coastwise—						
Fuel oil	13,020	1,860	118,610	16,944	2,055,457	1,815,106
Diesel and gas oil	.....	.....	34,940	4,991	195,112	152,544
Gasoline	244,669	34,944	194,911	27,844	1,757,232	2,006,148
Kerosene	11,000	1,571	6,480	926	147,990	125,378
Naphtha distillate	.....	.....	.....	.....	49,780	.....
Exports—						
Crude oil	.....	.....	.....	.....	107,736	3,075
Fuel oil	13,020	1,860	69,005	9,858	720,901	481,000
Diesel and gas oil	.....	.....	49,350	7,050	294,708	231,990
Gasoline	244,669	34,944	.....	.....	2,164,237	2,213,023
Kerosene	11,000	1,571	.....	.....	440,002	377,591
Lubricants	.....	.....	.....	.....	.....	18,672
Naphtha distillate	.....	.....	.....	.....	20,100	.....

cline as No. 1 Alferitz is not the best possible location. The General Petroleum completed No. 28 Heisen in the Mount Poso Field a few days ago and this new well is pumping 210 bbls. per day from 1,834 feet, the hole having been completed with an 8⅝-inch liner carrying 75 feet of perforated. The company also stepped out this week and staked four additional locations on the Heisen property, two scheduled to be spudded in shortly. The Golden Bear Oil Co., which recently erected a new rig in the Round Mountain Field in Section 6-28-29 and staked three additional locations, has not yet started actual drilling on these new projects. The Shell has abandoned No. 1 Williams, a wildcat in the Semitropic region of Kern County as a duster at 9,700 feet. This test, located in Section 17-27-23, logged numerous showings from time to time but none of the several tests conducted resulted in production. This well was plugged back by stages to 2,510 feet before being abandoned.

Huntington Beach

There was no change in the status of development work in the Huntington Beach Field of Los Angeles Basin, where a town lot drilling campaign will be precipitated if any of the several deep tests under way result in commercial production. W. E. McCaslin is rotating at 8,100 feet in No. 17 Transport, and, judging by the showings of both oil and gas, this well will bear watching during the next few weeks. This well failed to correlate with the Superior Oil Co.'s No. 1 Fee, which started present deep zone exploitation at Huntington Beach several months ago, but this unconformity may possibly be due to a faulted condition. The Superior Oil Co. has resumed drilling operations on No. 2-7 Gillette and this well will be carried down to the deep zone. This is the third well which the Superior started to the deep sand and thus tends to confirm the prevailing opinion that the Superior has encountered something of unusual interest in No. 1 Fee, which was suspended at 7,648 feet without being tested out. The Standard, which is running four strings of tools in the West Coyote Field of Los Angeles Basin, is rotating in the oil sand in No. 48 Emery and this well will probably be completed during the next few weeks. Drilling operations in the Playa Del Rey Field have been getting smaller from week to week with the result that there are only 10 strings of tools in operation. S. S. Wortley put his No. 3 Venice on a production test a few days ago at 5,583 feet, and, while the well came in flowing at the rate of 600 bbls. per day, it subsequently sanded up.

Weed Patch Field

The Shell has been experiencing a little delay in recompleting No. 1 Porter in the Weed Patch Field of Kern County, but this well, which was carried down to 8,419 feet and subsequently plugged back to 5,912 feet, should be ready for another production test shortly. The Shell's No. 1 Morris in Section 32-30-29 swabbed wet at 5,897 feet and another cement job will be necessary. Alpine Oil Co. resumed drilling in No. 1 DiGiorgio a few days ago and is at present coring ahead at 3,790 feet. Thomas H. Purman's No. 1 Avenal, a wildcat in the Pyramid Hills of Kings County, showed a decided change for the better during the past week, although the oil showing on the ditch may be coming from the brown shale which was present in the last core sample at 3,900 feet. The Kettleman Lakeview Oil & Gas Co. is making good progress in its Dudley Ridge wildcat, which is being drilled in an effort to develop commercial gas production around the 1,500-foot level. The Irma Investment Co.'s gasser in Section 7-23-20, which was recently finished at 1,347 feet, has been shut in.

The Barnsdall and Rio Grande are making preparations to drill out the cement in No. 1 Bishop-Evans, an outpost in the Elwood Field of Santa Barbara County, which is being drilled to determine the possibility of developing Sespe production, and an early test is expected to be made. In the Rincon Field, the General Petroleum is coring ahead in No. 2 Needham, a tideland project located on permit No. 55, and this well, which is at present in the oil sand, should be listed for early completion. Drilling operations in the Ventura Avenue Field have attained the lowest level reached in years due to the splendid curtailment work of the Associated and Shell. The Chanslor-Canfield Midway Oil Co. is still working on No. 2-A Hobson, a deep test at 10,030 feet, but this wildcat, approximately midway between the Rincon and Ventura Avenue Field, does not look particularly encouraging.

MRS. E. J. BULLOCK DIES

Mrs. Cora Wells Bullock, 57, wife of Edward J. Bullock, vice president of the Standard Oil Co. of Indiana, died on June 29 at the family home in Chicago. Death followed an illness of three weeks. Funeral services were held July 1 at the First Congregational Church. She is survived by four children.

BUREAU OF MINES PETROLEUM STATISTICS FOR MONTH OF MAY

According to reports received by the Bureau of Mines, Department of Commerce, the production of crude petroleum in the United States during May, 1931, amounted to 77,164,000 bbls., a daily average of 2,489,000 bbls. This represents an increase over the daily average in April of 52,000 bbls., but was 103,000 bbls. below the daily average of a year ago.

Texas was chiefly the source of the gain in crude output in May; the daily average output in that state rose from 893,000 bbls. in April to 951,000 bbls. in May. The major portion of the gain in Texas in May was registered in the East Texas Field, where the daily output rose from 251,000 bbls. in April to 308,000 bbls. in May. A total of 247 producing wells were completed in East Texas in May as against 197 in April; the May completions had a much smaller average daily initial output than the April completions. Daily average production in the other two major producing states, Oklahoma and California, increased slightly in May, the former as the result of a gain in output in the Oklahoma City Field, the latter from the completion of large wells at Kettleman Hills.

The increase in crude production was offset by a gain in throughput at refineries and crude stocks continued to decline. The major portion of the decline occurred in stocks of West Texas crude. Stocks of East Texas crude showed a material gain as production exceeded the refinery demand. Crude stocks in California continued their slow decline as evidence of the efforts being made there to balance supply and demand.

Refined products: The daily average crude throughput in May totaled 2,533,000 bbls., a gain over April of 43,000 bbls., but a decline from a year ago of 165,000 bbls.

Motor fuel production continued to increase and the daily average output in May amounted to 1,259,000 bbls. as against 1,220,000 bbls. in April. Daily average imports declined from 45,000 bbls. to 34,000 bbls., daily average exports rose from 140,000 bbls. in April to 161,000 bbls. in May. The daily average indicated domestic demand for motor fuel amounted to 1,152,000 bbls., an increase of 4 per cent over April but a decline from a year ago of 2 per cent. Stocks of motor fuel on hand May 31

(Continued on Page 86)

IMPORTANT SOUTHERN CALIFORNIA WILDCATS

Company, well and location—	S.T.R.	Depth	Status
Olympic Realty Corp., No. 1 Barnes, Los Angeles Co.	14- 2-15	6,078	suspended
Hines Pet., No. 1 Ocean Park, Los Angeles Co.	9- 2-15	6,510	circulating
Taylor Oil Co., No. 1 Culver, Los Angeles Co.	12- 2-15	6,238	suspended
Mesmer City Corp., No. 1 Mesmer, Los Angeles Co.	24- 2-14	6,650	sd. sh. drilling
Dwyer & Becker, No. 1 Compton, Los Angeles Co.	17- 3-13	4,520	suspended
Allison Synd., No. 1 Baldwin, Los Angeles Co.	8- 2-14	5,110	suspended
Cal. Ventura Oil Co., No. 1 Manhattan, Los Angeles Co.	30- 3-14	6,525	suspended
Cal. Ventura Oil Co., No. 1 Hermosa, Los Angeles Co.	31- 3-14	3,396	suspended
Cal. Ventura Oil Co., No. 2 Hermosa, Los Angeles Co.	31- 3-14	3,300	suspended
Cal. Oilfields Corp., No. 1 Hermosa, Los Angeles Co.	31- 3-14	2,560	suspended
Carniel Oil Corp., No. 1 Hermosa, Los Angeles Co.	31- 3-14	3,114	suspended
Tulsa Oil Co., No. 1 Hermosa, Los Angeles Co.	6- 4-14	3,060	10 bbls. daily
McMahon & McDonald, No. 1 Watts, Los Angeles Co.	12- 3-14	4,665	suspended
Thorpe Pet. Co., No. 1 Hawthorne, Los Angeles Co.	10- 3-14	3,745	suspended
Alondra Oil Co., No. 1 Hawthorne, Los Angeles Co.	33- 3-14	rig	rigging up
Staple Oil Co., No. 1 Manhattan, Los Angeles Co.	24- 3-15	2,700	suspended
Pacific Shore Oil Co., No. 1 Seawndale, Los Angeles Co.	20- 3-14	rig	rigging up
York & Smullin, No. 1 Watson, Los Angeles Co.	29- 4-13	4,310	test'ng
Wilmington Consd., No. 1 Watson, Los Angeles Co.	17- 4-13	1,012	suspended
Pedro Pet. Corp., No. 1 San Pedro, Los Angeles Co.	14- 5-14	....	location
Brubaker, W. O., No. 1 Van Nuys, Los Angeles Co.	11- 2-15	2,700	suspended
Rucker & Croul, No. 2 Puente, Los Angeles Co.	27- 2-10	2,200	suspended
Arden Oil Co., No. 1 Puente, Los Angeles Co.	15- 2-10	3,325	suspended
D. & B. Oil Co., No. 1 Puente, Los Angeles Co.	3- 2-10	4,620	suspended
El Dorado Oil Co., No. 1 Puente, Los Angeles Co.	30- 2- 9	1,360	br. sh. drilling
Marcel Pet., No. 1 Puente, Los Angeles Co.	31- 2- 8	3,100	suspended
Cudahy Oil Co., No. 1 Bell, Los Angeles Co.	30- 2-12	1,370	suspended
The Texas Company, No. 1 Montebello, Los Angeles Co.	4- 2-12	4,650	hd. sd. drilling
Blinn & Gray, No. 1 Montebello, Los Angeles Co.	6- 2-11	4,344	cleaning out
West Oil Co., No. 1 Montebello, Los Angeles Co.	34- 1-11	4,842	suspended
Yellowstone Oil Co., No. 1 Alhambra, Los Angeles Co.	24- 1-13	3,540	gr. sd. drilling
Yellowstone Oil Co., No. 2 Alhambra, Los Angeles Co.	19- 1-12	rig	rigging up
Los Gatos Oil Co., No. 1 El Monte, Los Angeles Co.	16- 1-11	2,280	suspended
Rucker, L. W., No. 1 Calabasas, Los Angeles Co.	26- 1-17	753	cleaning out
Olympic Corp., No. 1 Calabasas, Los Angeles Co.	18- 1-17	5,960	suspended
Ness Pet., No. 1 Newport, Orange Co.	21- 6-10	4,910	suspended
Hall, H. L., No. 1 Newport, Orange Co.	20- 6-10	796	suspended
Standard, No. 1 Newport, Orange Co.	26- 6-10	5,190	hd. sd. drilling
Western Gulf, No. 1 Santa Ana, Orange Co.	12- 3- 8	3,267	suspended
Gleck Oil Co., No. 1 Sunset Beach, Orange Co.	20- 5-11	5,070	br. sh. drilling
Beck, F. A., No. 1 Corona, Riverside Co.	8- 4- 6	490	sd. sh. drilling
Beck, F. A., No. 1 Beaumont, Riverside Co.	1- 3- 1	520	sd. sh. drilling
Grey, H. H., No. 1 Redlands, San Bernardino Co.	25- 1- 2	2,392	suspended
Borderland Oil Co., No. 1 Encinitas, San Diego Co.	12-13- 4	2,519	suspended
Borderland Oil Co., No. 1 Point Loma, San Diego Co.	30-16- 3	4,975	hd. sd. drilling
South Bay Oil Co., No. 1 Border, San Diego Co.	31-18- 2	....	material
Carr, O. K., No. 1 Capistrano, San Diego Co.	13- 8- 8	5,250	suspended

IMPORTANT NORTHERN CALIFORNIA WILDCATS

Company, well and location—	S.T.R.	Depth	Status
Western Gulf, No. 1 Santa Maria, Santa Barbara Co.	5- 9-35	6,760	cemented
Barnsdall, No. 1 Gato Ridge, Santa Barbara Co.	9- 8-32	2,501	1,200 bbls.
M'dwest Oil Co., No. 1 Los Alamos, Santa Barbara Co.	2- 7-33	2,800	sd. sh. drilling
Smith, W. E., No. 1 Lompoc, Santa Barbara Co.	18- 7-34	100	suspended
Zaca Oil Co., No. 1 Los Olivas, Santa Barbara Co.	20- 7-31	rig	rigging up
General Pet., No. 1 Goleta, Santa Barbara Co.	21- 4-28	4,533	gas—shut in
General Pet., No. 2 Goleta, Santa Barbara Co.	21- 4-28	4,350	gas—shut in
General Pet., No. 3 Goleta, Santa Barbara Co.	21- 4-28	5,450	Sespe form.
General Pet., No. 133 Goleta, Santa Barbara Co.	21- 4-28	2,030	suspended
General Pet., No. 134 Goleta, Santa Barbara Co.	21- 4-28	2,053	suspended
General Pet., No. 136 Goleta, Santa Barbara Co.	21- 4-28	2,047	suspended
General Pet., No. 137 Goleta, Santa Barbara Co.	21- 4-28	2,050	suspended
General Pet., No. 138 Goleta, Santa Barbara Co.	21- 4-28	4,931	suspended
General Pet., No. 139 Goleta, Santa Barbara Co.	21- 4-28	2,051	suspended
Boles Oil Co., No. 140 Goleta, Santa Barbara Co.	22- 4-28	1,040	suspended
U. S. Pet., No. 141 Goleta, Santa Barbara Co.	20- 4-28	1,035	suspended
U. S. Pet., No. 142 Goleta, Santa Barbara Co.	20- 4-28	2,012	suspended
U. S. Pet., No. 143 Goleta, Santa Barbara Co.	20- 4-28	1,019	suspended
El Camino, No. 149 Goleta Tideland, Santa Barbara Co.	22- 4-28	1,035	suspended
Bolsa Chica, No. 191 Goleta, Santa Barbara Co.	24- 4-29	4,191	suspended
Bellview Oil Co., No. 159 Goleta, Santa Barbara Co.	24- 4-29	2,099	suspended
Cochran, J. H., No. 1 Naples, Santa Barbara Co.	7- 4-29	5,134	cleaning out
Johnson, George, No. 1-A Goleta, Santa Barbara Co.	19- 4-27	3,780	Sespe form.
Sovereign Oil Co., No. 1 Guadalupe, Santa Barbara Co.	20-10-35	5,500	redrilling
Pacific Western, No. 1 Gibraltar, Santa Barbara Co.	14- 5-27	2,345	suspended
Associated, No. 1 Rincon Creek, Ventura Co.	19- 4-24	2,080	suspended
C.C.M.O. Co., No. 2-A Rincon, Ventura Co.	23- 2-24	10,030	plugging back
Continental, No. 1 Rincon, Ventura Co.	23- 3-24	5,179	sd. sh. drilling
Pure Oil Co., No. 1 S. P. Canyon, Ventura Co.	15- 4-21	2,591	suspended
Superior Oil Co., No. 1 Sespe, Ventura Co.	14- 4-21	7,275	hd. sd. drilling
San Pedro Oil Co., No. 2 Sespe, Ventura Co.	13- 4-21	3,410	pipe froze
Maga Synd., No. 1 Oxnard, Ventura Co.	17- 1-21	4,910	suspended
Mex Cal Oil Co., No. 1 Conejo, Ventura Co.	12- 1-20	188	suspended
Hansen Pet., No. 1 Conejo, Ventura Co.	24- 1-20	230	suspended
Wilshire Oil Co., No. 1-A Buttonwillow, Kern Co.	7-29-24	7,000	cleaning out
Kent & McDonald, No. 1 Temblor Hills, Kern Co.	3-32-22	1,702	cemented
Calif. Oil Producers, No. 1 McKittrick, Kern Co.	30-30-22	3,111	sd. sh. drilling
Federal Drlg. Co., No. 1 Buena Vista, Kern Co.	20-31-24	5,367	suspended
General Pet., No. 1 Beiridge, Kern Co.	30-28-21	5,300	br. sh. drilling
The Texas Company, No. 1 Beiridge, Kern Co.	22-27-20	5,045	suspended
Standard, No. 2 Beiridge, Kern Co.	31-27-20	5,591	recemented
Ohio Oil Co., No. 1 Beiridge, Kern Co.	36-27-20	5,980	suspended
Continental, No. 1 Beiridge, Kern Co.	36-27-20	5,253	cleaning out
Wallace, K. C., No. 1 Beiridge, Kern Co.	32-29-21	4,222	recemented
R'o Cal. Pet., No. 1 Shale, Kern Co.	2-27-18	2,355	suspended
Wicker, Sy, No. 1 Arvin, Kern Co.	12-30-28	1,250	cleaning out
Shell, No. 1 Weed Patch, Kern Co.	29-30-29	5,910	testing
Shell, No. 2 Weed Patch, Kern Co.	29-30-29	6,410	suspended
Shell, No. 3 Weed Patch, Kern Co.	32-30-29	5,899	deepening
Osborn, Colter, No. 1 Weed Patch, Kern Co.	15-30-29	3,815	to recement
Mohawk Oil Co., No. 1 Weed Patch, Kern Co.	32-30-29	6,150	suspended
Mohawk Oil Co., No. 2 Weed Patch, Kern Co.	4-31-29	rig	suspended
Alpine Oil Co., No. 1 Weed Patch, Kern Co.	13-31-29	3,785	coring
Standard, No. 1 Devils Den, Kern Co.	14-25-18	3,313	plug 1,600 ft.
Hannah, Tom, No. 1 Devils Den, Kern Co.	25-25-18	2,925	suspended
Cumberland Oil Co., No. 2 Devils Den, Kern Co.	21-26-18	rig	rigging up
Temblor Dev. Co., No. 1 Blackwell Corner, Kern Co.	14-26-19	1,030	suspended
E. J. Miley, No. 1 Blackwell Corner, Kern Co.	17-26-19	rig	suspended
Shell, No. 1 Semitropic, Kern Co.	17-27-23	9,700	abandoning
Moran & DeCamp, No. 1 Mojave, Kern Co.	26-10-14	750	suspended
Kendall Dev. Co., No. 1 Mojave, Kern Co.	27-11- 9	511	cleaning out
Meridan Oil Co., No. 1 Antelope, Kern Co.	11- 9-15	3,804	suspended
Ritchie, J. J., No. 1 Tejon, Kern Co.	33-11-19	6,025	suspended
Associated, No. 1 Jacalitos, Fresno Co.	22-21-15	5,660	sd. sh. drilling
Panorama Oil Co., No. 1 Carizzo, San Luis Obispo Co.	7-31-21	4,019	suspended
Trav El Oil Co., No. 1 Carizzo, San Luis Obispo Co.	7-32-22	2,030	suspended
Cities Service, No. 1 Creston, San Luis Obispo Co.	20-28-15	1,160	sd. sh. drilling
Paso Robles Synd., No. 1 Paso Robles, San Luis Obispo Co.	34-27-11	4,015	suspended
Latin Amer. Pet., No. 1 Shandon, San Luis Obispo Co.	21-27-15	4,615	recemented
Schilling, C., No. 1 Atascadero, San Luis Obispo Co.	24-28-12	1,220	suspended
Schockley, C., No. 1 Pismo, San Luis Obispo Co.	13-32-13	3,094	suspended
Jergins, A. T., No. 1 Arroyo Grande, San Luis Obispo Co.	6-32-13	416	sd. drilling
Pacific Inland, well No. 1, Monterey Co.	19-23-15	1,340	suspended
Irma Investment Co., No. 1 Dudley Ridge, Kings Co.	7-23-20	1,345	gas well—idle
O'Donnell, J. E., No. 1 Dudley Ridge, Kings Co.	7-23-20	1,635	gas well—idle
Eagle Oil Co., No. 1 Dudley Ridge, Kings Co.	15-23-20	rig	suspended
Kettleman Lakeview, No. 1-A Dudley Ridge, Kings Co.	20-23-20	618	sd. sh. drilling
Purman, T. H., No. 1 Reef Ridge, Kings Co.	36-23-17	3,900	br. sh. drilling
Seymour, L. W., No. 1 Avenal, Kings Co.	10-28-16	1,148	cleaning out
Twin State Oil Co., No. 1 Point Arena, Mendocino Co.	14-12-17	6,750	sd. sh. drilling
Orinda Pet., well No. 1, Contra Costa Co.	32- 1- 3	2,012	cleaning out
Ducor Pet. Co., No. 1 Ducor, Tulare Co.	14-24-27	2,180	redrilling
Inland Valley Oil Co., No. 1 Visalia, Tulare Co.	24-17-24	3,092	suspended
Ellis & Stanford, No. 1 Tulare Lake, Tulare Co.	20-24-23	1,006	sd. sh. drilling
Ellis & Stanford, No. 2 Tulare Lake, Tulare Co.	20-24-23	100	sd. drilling
Colusa Oil Co., No. 1 Bush, Colusa Co.	31-15- 4	930	hd. sd. drilling
Oakdale Oil Co., No. 1 Oakdale, Stanislaus Co.	3- 2-10	4,170	hd. sd. drilling
Orland Oil Synd., No. 1 Orland, Tehama Co.	31-23- 3	2,520	redrilling
Sargent Oil Co., No. 1 Sargent, Santa Clara Co.	1-12- 3	rig	suspended

Old Lima Field Has Best Well of Week

Indiana Wildcat Dry After Slight Showing. Illinois Gets Small Oil Well and Kentucky 50-Bbl. Well and Several Gas Wells

By George A. Whitney
Staff Correspondent, Central West Fields

FINDLAY, Ohio, July 6.—In the old Lima Field of northwestern Ohio the best oil well found during the week was drilled by John Doblinger on the Glen Lose farm, Section 8, Monclova Township, Lucas County, and west from Toledo, doing 22 bbls. initial from the Trenton formation. Another test will be drilled in the western part of Lucas County by the Lake Shore & Southwestern Oil & Metal, Inc., on the Francis Oberly farm, in Providence Township. No report has been received from the test by M. Gray on the Keil Brothers 100-acre farm, Section 28, Springfield Township, also in Lucas County, westward from Toledo.

In Hardin County, Cessna Township, in the southern portion of the Lima Field, the Commonwealth Gas Corp. found what shows for a failure in No. 1 Carl Searson farm, Section 8, at 1,492 feet. Jeffries and others report a dry hole on the George P. Jones farm, Section 24, Crawford Township, Wyandot County, around 1,340 feet. Newcomer and others are drilling on the Charles Neate farm, Section 28, Crane Township, also in Wyandot County. Jones & Coyle are starting a test on the Robert and Richard Criswell farm, Section 17, Tymochtee Township, same county, and McKinney & Drickler are drilling No. 1 Burton Ramsbury farm, same section.

W. A. Rucker is drilling No. 3 on the P. Gaffena farm, Section 25, Cynthian Township, Shelby County, in the southwestern part of the Lima Field.

Recovery Oil & Gas Co.'s test on the E. and E. Vogel farm, Section 32, Seneca Township, Seneca County, and in the Tiffin Field, came in a duster from 1,479-1,529 feet.

Plenty old producing wells in the Lima Field are reported abandoned. In Wood County, Plain Township, the Ohio Oil Co. pulled out Nos. 13 and 27 Oliver Mitchell farm, Section 35, also No. 15 S. L. Mitchell farm, same section. Same company abandoned No. 7 Caleb Mercer farm, Section 12, Liberty Township, also Nos. 10, 18, 19, 23 and 27 Henry Fernside farm, Section 2, and in Bloom Township, same county, same company abandoned Nos. 10, 11 and 12 E. Goldner farm, Section 32; No. 14 Mary A. E. Shoemaker, Section 18, and No. 9 Solar Refining Co. in Section 31. Donald Oil & Gas Co. abandoned No. 3 Levi Brobst farm, Section 16, Henry Township, Wood County, also No. 16 J. W. Sterling farm, Section 21, same township. Some remarkably fine producers were drilled on these farms in the early days of Trenton rock oil.

In Allen County, the Ohio Oil Co. abandoned Nos. 2, 3, 4, 5, 6, 7 William Post farm, and Nos. 1 and 2 W. F. Savidge farm, both in Section 26. Same company did the same with No. 5 A. Crider farm, and Nos. 2 and 5 B. Osman farm, both in Section 28, Bath Township, also No. 6 on the E. G. Dusenberry farm, Section 9, Perry Township, Allen County.

In Mercer County, Center Township, the Ohio Oil Co. abandoned Nos. 1 and 2 James P. Logue farm, Section 25.

Sandusky County has its usual number of old wells abandoned and those abandoned by the Ohio Oil Co. are: Nos. 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 and 20 S. E. Stahl farm, Section 33, Scott Township; Nos. 2, 5, 7, 8 and 9 D. Cochard farm, Section 34, same township; Nos. 1, 2, 5, 6, 7, 9 and 10 L. Lehman, and Nos. 2 and 11 Elsie Zimmerman farm, same section. In Jackson Township, J. Park Ludwig pulled out and abandoned old Nos. 1, 2 and 3 Retta Ludwig farm, Section 7.

Lake Shore & Southwestern Oil & Metal, Inc., is drilling a wildcat near Grand Rapids and west of Toledo, in Grand Rapids Township, Wood County. George L. Haubert and others are drilling No. 6 Catherine Smith farm, Section 29, Perrysburg Township, same county.

R. W. Kirk and others are drilling No. 3 on the E. H. James farm, Section 34, Biglick Township, Hancock County, being the only well now drilling in the county.

INDIANA

The only completion reported for the week in Indiana was a wildcat drilled by the Mich-Ohio Oil Co., on the Brenneman farm in Monon Township, White County, in the western side of the State, which has been drilling for close to two years. The well had a slight showing of oil, but nothing has been done with it for a long while and it goes into the dry hole column.

A. R. Morris and others are drilling on the S. Kauffman farm, Section 4, Washington Township, Sullivan County.

CENTRAL OHIO

In the Central Ohio Field, eight wells were reported for the week, of which three were dry, four were gas and one oil with an initial production of 5 bbls. The gas volume is not as prolific as in the earlier days owing to the heavy drain upon the producing sands. Operators are drilling more for gas than for oil, owing to the low price of crude, and gas is the best from a compensation view as there is a ready market.

Athens County showed three wells completed. The Hocking Valley Drilling Co.'s No. 1 on the Price-Batton farm, Section 17, York Township, of the county, is a fairly good gas well at a depth of 3,255 feet. The Chartiers Oil & Gas Co. also has a fair gas well in No. 1 on the Dora A. Wilson farm, same section and township, in the Clinton lime formation. Ohio Fuel Gas Co. has a gas well in No. 1-5,505 on the James Schuler farm, Section 11, Lodi Township, same county, in the lower Berea sand. Vance S. Morgan is drilling on the Hocking Valley Railroad, Section 23, same township. Hope Construction & Refining Co. is drilling a second test on the Ira B. Davis farm, in fractional Section 18, Carthage Township, same county.

In Medina County, Chatham Township, Edson Sons Co.'s No. 16 Archie E. Packard farm, Lot 13, is reported good for 5 bbls. from 395 feet. In Homer Township, same county, the Commonwealth Oil Corp. found a dry hole on the Charles Fenstemaker farm, Section 15, and a light gas well in No. 4 Frank Rhader farm, Section 4, same township, at 2,948 feet.

In Muskingum County, Brush Creek Township, Fritz Oil & Gas Co. reports a dry hole in No. 1 W. W. Swingle, Section 29, at 4,178 feet. Whitehill Oil Co. has started drilling No. 5 James Boyer farm, Section 6, Hopewell Township, and No. 6 is also drilling on the same farm.

In Belmont County, Union Township, Frank Stranges and others' No. 4 J. H. Barber farm, Sections 27-33, is a duster at 1,576 feet. Washmuth & Callahan is reported having an oil showing on the G. and H. C. Butler farm, in Somerset Township, same county, from 1,799 to 1,858 feet, which is the Berea sand.

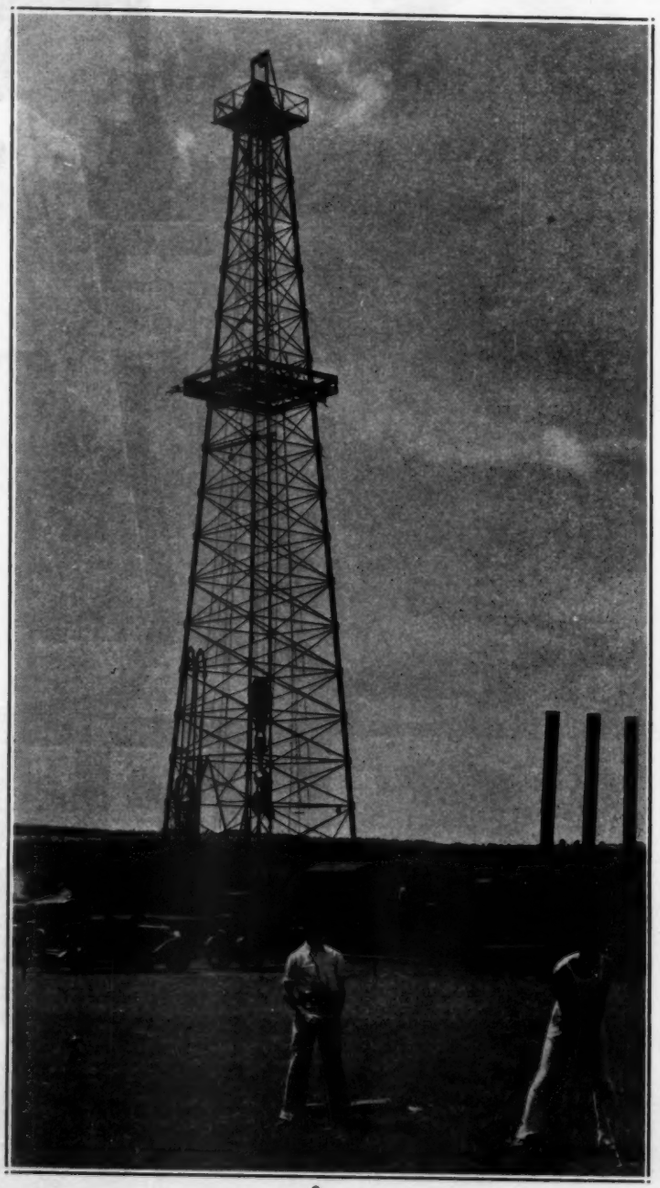
In Knox County, Howard Township, H. E. Perkins has started a test on the Gertrude Weaver farm, Lot 17.

In Stark County, the most active developing field in the Central Ohio area, the Wittmer Properties, trustee, is drilling on the Samuel Myers farm, Section 15, Lawrence Township, and has also staked locations for No. 1 J. Kostelink, and No. 1 Mary and J. Shuman, also in Section 15. In Jackson Township, Medford Oil & Gas Co. made a location on the W. and D. Froman farm, Section 23. Wiser Oil Co. is drilling on the Louis A. Firestone farm, Section 34, same township.

Wehrle Gas Co. is drilling on the Hartman & Loughman farm, Lot 17,

(Continued on Page 127)

NO. 1 HARRIS IS TENTH HOLE ON WEWOKA GOLF COURSE



Here is the tenth hole on the Wewoka, Okla., municipal golf links, which is virtually wildcat territory. The Empire Oil & Refining Co. is drilling it to the Gilcrease sand and both the company and the city are hoping of course for a gusher. The well is officially designated as No. 1 Harris. Two other wells drilled on the links are shallow-sand producers.

The Wewoka golf course afforded diversion for hundreds of oil men when the Seminole boom was at its height and it is known as an exceptionally difficult nine-hole course. The roustabouts employed on No. 1 Harris have a hard task keeping slush from the well from spreading beyond the limits imposed for the operation.

Active Oil Men Before The Journal's Cameras

1—Perry, Okla., Magnolia drilling crew: R. A. Brown, Oil Well Supply; Bob Rowan, truck driver; Boots Hiskett, morning tower driller; J. C. Hogle, evening driller; Walter Eubank, backup man; Walter Sherman, pipe racker. 2—William R. Boyd, III, Richmond, Va. 3—Thomas J. Lipman, Magnolia Petroleum Company, Davenport, Okla.; Fred Thilenius, Prescott Pump Company. 4—J. E. Beall, Gulf Production Company, Longview, Tex.; Ray W. Richmond, field umpire, Tyler, Tex. 5—C. L. Ware, M. A. Dalton, W. C. Burkhart, welders for A. F. Day Construction Company. 6—William O'Conner, Atlantic Refining Company, Philadelphia, Pa.; L. J. Drake, Union Tank Car Company, Chicago; W. T. Holliday, Standard Oil Company of Ohio, Cleveland, Ohio; Robert R. Penn, Penn Oil Company, Dallas, Tex.

and HEAT RESISTING ALLOY STEELS

contribute a major share to the excellence of these alloy steel products.

Five subsidiary manufacturing companies of the United States Steel Corporation, engaged in the production of U S S Stainless Steels, have devoted their facilities to the material expression of these cardinal principles. The companies listed below invite your inquiries.

U·S STEEL

American Sheet and Tin Plate Company, Pittsburgh
Sheets and Light Plates

American Steel & Wire Company, Chicago
Cold Rolled Strip Steel, Wire and Wire Products

Carnegie Steel Company, Pittsburgh, and Illinois Steel Company, Chicago
Bars, Plates, Shapes, Special Sections and Semi-Finished Products

National Tube Company, Pittsburgh
Pipe and Tubular Products

Pacific Coast Distributors: COLUMBIA STEEL COMPANY, San Francisco
Export Distributors: U. S. STEEL PRODUCTS COMPANY, New York City

Typical Uses:

¶ **AUTOMOTIVE and AERONAUTIC**—For radiator shells, hub caps, lamps, bumpers, moldings, polished parts and fittings, hardware and trim, airplane parts and instruments.

¶ **MANUFACTURING and INDUSTRIAL**—Machinery and furnace parts, dampers, fans, preheaters, pumps, conveyors, turbine blades, nozzles, plungers, and machinery specialties.

¶ **CHEMICAL**—Vats, tanks, stills, digesters, condensers, retorts, paper and pulp manufacturing equipment, circulation systems, and laboratory apparatus.

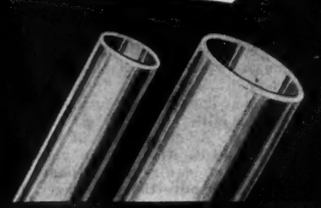
¶ **OIL REFINING**—Bubble caps, still tubes, linings, heat exchangers, ducts, containers, tanks, agitators, and other refining equipment.

¶ **FOOD HANDLING**—Pasteurizers, tables, hospital and hotel kitchen equipment, restaurant fixtures, cafeteria trays, food preserving and dairy machinery and accessories, ice cream and milk containers and utensils.

¶ **ARCHITECTURAL**—Structural members and supports, hinges and hardware, decorative metal embellishments, flat surface facings, moldings, doors, grilles, panels, and ornamental work.

¶ **HOME APPLIANCES**—Kitchen equipment, cooking and canning utensils, furniture, cabinets, electrical appliances, sinks, plumbing fittings, stoves, ranges, and tableware.

¶ **MISCELLANEOUS**—Packing house equipment, soda fountain counters and fixtures, display cases, humidors, handles, hooks, trays, golf clubs, skates, switch boards, metallic mirrors, laundry machinery, tank cars, railway car parts and fittings, and many other uses where beauty and resistance to corrosion are important factors.

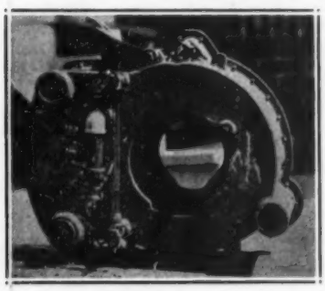


Modern Requirements

Oil Industry Equipment and Supplies

WRIGHT METER DESIGNED TO MEET FIELD PROBLEM

The Wright oil meter, invented and put on the market by R. L. Wright, 1224 South Frankfort Avenue, Tulsa, is designed to meet a need arising from production operations which treat the individual well, rather than the lease, as the unit of revenue. It is recognized that getting accurate individual gauges



of wells in the 20 to 600-bbl. class is one of the problems of efficient oil production, and the Wright meter is offered as an economical solution.

In wells that make water a water by-pass is used in connection with the meter, so that free water can be by-passed underneath the meter and not recorded. The vital information on how much oil the well makes thus can be obtained. The by-pass design is such that there is not a moving part in it.

The problems which had to be met in order to develop a successful and practical meter included these:

1. The free gas which is produced with the oil should not record as liquid.
2. The meter should be gas tight so there will be no loss in gravity of the oil.
3. It should be arranged so that if it sticks or stops owing to foreign matter such as sand, scale, soft rope, swab rubber, or stuffing box rings, getting into it no additional back pressure will be placed on the well.
4. It should have zero for a minimum capacity because of the heading nature of some pumping or flowing wells, in that there is no flow of fluid in the lead lines for short periods of time.
5. It should record directly in barrels.
6. The meter should have an indicator to tell whether it has run perfectly for the previous 24 hours or for the duration of the test.
7. It should be rugged and simple in construction.

The Wright oil meter is said to meet all these requirements. Regarding the last point the meter does not have any valves or calibration adjustments, and does not require a skilled workman to take the meter apart and clean, which it will require periodically to remove any paraffin which might deposit on the moving parts.

The materials used in the construction of the meter were selected for their corrosion resistance properties.

The meter is now performing successfully in actual field operations, and is fully protected by patent application.

The meter is being placed on the market by R. L. Wright, 1224 South Frankfort Avenue, Tulsa, Okla.

Robert Dougan, formerly connected with the Gulf Concrete Pipe Co. of Houston, Tex., has been made manager of the structural products department in the Tulsa district of Wickwire Spencer Sales Corp. to take the place of J. M. Mercer, who resigned to go into business in California as a member of the Curtis Whitney Steel Co.

NOTES ABOUT TRADE LITERATURE

Littleford Brothers, Cincinnati, Ohio, have issued two catalogs covering the two divisions into which their products are grouped. One describes the company's plate and sheet steel fabrication and erection service. The other is a contractors' equipment catalog.

"Ball and Roller Bearings," a 68-page handbook for designers and engineers, has been published by the Aetna Ball Bearing Manufacturing Co., 4600 Schubert Avenue, Chicago.

Photographs of Allsteel oil-field hoists, pipe line winches and automatic-release pipe tongs in actual operation are reproduced in an interesting book published by the Allsteel Products Manufacturing Co., Whichita, Kans., and called "Equipment in the Field."

Useful information concerning the installation and care of belts is contained in a 40-page booklet, "Belt Practice," published by the Diamond Rubber Co., Akron, Ohio.

"Fires and How They Happen" is among articles of value in the current number of the Columbian Marketer, published by the Columbian Steel Tank Co., Kansas City, Mo.

Handling and rehandling of fuller's earth at the oil refinery is the subject of a new book, No. 1,217, issued by the Link-Belt Co., Chicago and Philadelphia. Link-Belt conveying equipment plays a large part in this work and in handling petroleum coke, a refinery by-product.

The operating record of a 15-year-old Diesel plant in Madison, S. Dak., is recounted in a 16-page illustrated booklet prepared by the Busch-Sulzer Bros.-Diesel Engine Co., St. Louis, Mo.

A bulletin containing a chart for rapid and accurate calculation of expansion loops made up with tube-turns and straight runs of pipe is being distributed by Tube-Turns, Inc., Louisville, Ky. Engineers will find it of special value.

A discussion of the features and service records of the Curtiss and Wright lines of airplane engines, with special reference to materials used in their construction, is contained in a publication issued by the International Nickel Co., New York.

The Brown Instrument Co., Philadelphia, Pa., has published a 48-page catalog, No. 1,101, featuring a line of potentiometer pyrometers recently introduced by this company.

The Pacific Pipe & Supply Co., Los Angeles, Calif., has published a leaflet covering the application of Papico natural gas odorization equipment. It is said that this type of equipment is used extensively to odorize natural gas consumed in southern California and other districts.

Shand & Jurs, Berkeley, Calif., have issued a bulletin showing the full throttling type S. & J. liquid level controllers and a new series of gas or air actuated diaphragm valves.

FIRE-LINE PLOW BEHIND "CATERPILLAR" TRACTOR

The Hester Plow Co., Inc., Jacksonville, Fla., in response to the demand for a fire line plow of sufficient strength to operate behind a "Caterpillar" tractor, now offers such a tool. The Hester four-disk fire-line plow, operated with the "Caterpillar" Twenty in second gear, plows a clean fire line from 5 feet to 6 feet wide in the clear; and the ridge of fresh soil thrown up on each side of the line leaves a finished fire line 8 feet to 9 feet wide at one operation. There is a special chisel provided to remove the center baulk. The plow makes a continuous line on curves as well as on a straight cut.

GOULDS PUMPS CHANGES

H. W. Foulds, assistant to the president, and general sales manager of Goulds Pumps, Inc., Seneca Falls, N. Y., has announced several changes in the headquarters and branch office staffs of the company. Henry L. Boyer was appointed manager of farm-suburban sales, Henry F. Miller manager of industrial sales, W. C. Allen manager of engineering sales, J. B. Anderson in charge of department of inquiry and estimate, and G. W. Cramer advertising manager. The following appointments in branch house organizations have been made: Mark D. Rowe, formerly eastern manager Servel Sales, Inc., now manager New York office; J. B. Foley, formerly manager Goulds Pittsburgh office, now manager Chicago office, and Fred Jones, formerly connected with Goulds Philadelphia office, now manager of Pittsburgh office. The company has opened a branch office in Dallas, Tex., at 417 Magnolia Building, with Fred Hayes as manager.

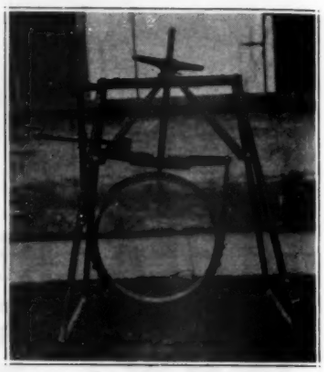
MEN KNOWN *in* THE EQUIPMENT FIELD

Alvin Zwerneman

Alvin Zwerneman, commonly known as "Dutch," for many years employed by the Axelson Manufacturing Co., Los Angeles, Calif., has been promoted to director of sales in the California division. Mr. Zwerneman has been in the oil well equipment business for 12 years, 9 in the employ of the Axelson company. He has familiarized himself with the pumping problems of the Mid-Continent fields, as well as those in California.

SMALLER NUMBER OF MEN NEEDED WITH PIPE JACK

The Pipe Line Service Corp., 205 West Wacker Drive, Chicago, announces a new piece of equipment for pipe line construction work which promises to do away with much of the labor involved in lining and welding the line segments. This is the Owens pipe jack, which is said to enable the welder and helper to do the



job ordinarily performed by eight men.

The Owens pipe jack consists of a steel frame which is set across the pipe, and an elevating member which extends down from a turnbuckle device at the center of the top bar of the frame. The lower terminus of the elevating member has a crossbar to the extremities of which are attached the ends of a roller-bearing chain which is placed around the pipe. At one end of the crossbar there is an extension which is attached to the side of the frame through a turn-screw arrangement which controls the position of the pipe in a horizontal plane.

Segments of pipe line ranging from 600 feet to 3,000 feet have been lined and welded by two men at the side of the trench. For the longer segments eight of the jacks were used. The frames were placed over the pipe and the chains detached from the crossbars were slipped under the pipe and reattached to the crossbar. The trunkbuckles at the top of the frame elevated the pipe. Ends of the pipe lengths were then brought together and one man made the welds as the other turned the pipe.

TRACKSON INTRODUCES STEEL CRAWLER WAGON

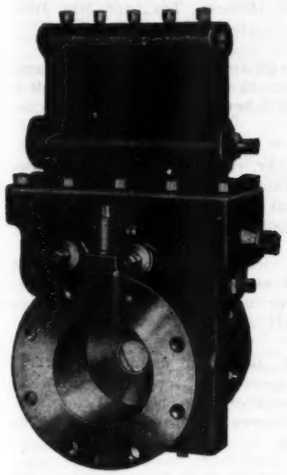
The Trackson Co., Milwaukee, Wis., which recently produced Trackson crawler wheels, which are proving useful in dirt hauling operations, now introduces a complete 7-yard crawler wagon. This latest Trackson product is a bottom-dump cart type wagon with extra strong front and rear ends, improved tongue and drawbar connections, a sturdy body that sheds the dirt, a simple, easily operated door-winding device, greater clearance on the dump, light weight and extraordinary strength, improved design, renewable parts and crawler wheels.

The Trackson crawler wagon weighs only 8,800 pounds complete. It is built entirely of steel, with reinforcements at the points subject to greatest wear and strain. At the front and rear ends, for instance, are box-shaped, cast steel headers. Extra heavy 8-inch pipe provides a straight, tubular tongue of strong construction, clamped between the two front header castings and thus practically becomes an integral part of the frame structure.

Oil Industry Equipment and Supplies

SHUTOFF VALVE FEATURE OF NEW ORIFICE FITTING

A new type of orifice fitting has been introduced by Daniel & Co. of 1900 Santa Fe Avenue, Los Angeles, Calif. It is compact, is simple in construction and operation, and uses the thin type of orifice plate. One design is employed



for both high and low pressures with the wall thickness varying for different duties.

A feature is the steel shut-off valve, which seats on a ground surface with a metal-to-metal contact. The valve is held against the seat with a powerful thrust by eccentrics operated by rods leading through stuffing boxes to the outside of the fitting. The line pressure itself assists in keeping the valve tight, and tests up to 2,000 pounds per square inch are said to have disclosed no signs of leaking.

The plate holder is raised and lowered by means of pinions which engage gears on each side of it. These pinions are revolved by rods extending through stuffing boxes. One crank-type wrench alone is used for all operations in changing plates.

Since high temperatures do not affect the operation, the Daniel orifice fitting is good for steam, natural gas, highly volatile gasoline oils, water or for any application where orifice meters can be used. It is said to offer maximum safety and simplicity with minimum maintenance. An illustrated circular on its construction and operation is furnished upon request.

INTRODUCING TRU-LEDE TAP

The Tru-Lede tap made by the Greenfield Tap & Die Corp., Greenfield, Mass., is for production threading and designed to overcome lead error, transmitted in threading from the tap to the work. Tru-Lede taps, made from high speed steel, are said to eliminate lead error as an assembly factor. The permitted lead tolerance on Tru-Lede taps is .0005 inch in 1 inch of thread. This accuracy is possible because the threads of Tru-Lede taps are ground after hardening. Tru-Lede taps have the same pitch and major diameter tolerances as cut thread taps. Their shanks are ground concentric with the threads, which prevents taps from wabbling and cutting oversize. Besides eliminating the most troublesome factor in screw thread assembly, a Tru-Lede tap is said to require less power to drive, operates with less friction, can be run at high speeds, wears longer and consequently reduces the cost per tapped hole.

AMONG THE EQUIPMENT HOUSES

F. W. Miller, formerly vice president of Rogers Brown & Crocker Brothers, Inc., has been appointed vice president of the Swann Chemical Co., and he will have charge of its Cincinnati, Ohio, office.

A contract for a refinery distilling unit with a capacity of 75,000 bbls. per month has been awarded by the Kendall Refining Co., Bradford, Pa., to Alco Products, Inc., a division of the American Locomotive Co. The unit will be one of the largest of its type in the Pennsylvania district.

H. A. Jackson, president of the Chicago Pneumatic Tool Co., 6 East Forty-fourth Street, New York, announces the election as executive vice president of W. L. Lewis, who for the past year has been vice president in charge of finance of this company and was formerly assistant comptroller of the Bethlehem Steel Corp.

Arthur G. McKee & Co., engineers and contractors of Cleveland, Ohio, have received a contract from Distillazione Italiana Combustibiles, S.A., Venice, Italy, for process petroleum refining equipment designed to increase the efficiency and capacity of existing petroleum refinery process units. This is the second contract placed by the company with McKee in the past three months.

The Turbo-Mixer Corp., New York, has appointed the National Supply Co. to represent it on all products of its manufacture for the petroleum industry in Texas, Oklahoma, Louisiana, Arkansas and southern California.

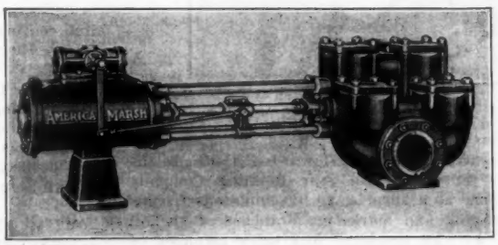
C. Wilson, Jr., vice president and general manager of the Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., is now supervising the sales department of that organizations following the resignation of H. W. Bishop, Jr., as general sales manager.

An order for 750 tons of electric-welded steel pipe for the city of New York has been placed with Alco Products, Inc., a division of American Locomotive Co. The pipe, of 48-inch diameter, will be used for extensions to the water supply system in the Bronx. It will be fabricated in the plant of the American Locomotive Co. in Dunkirk, N. Y.

The Brauer Machine & Supply Co., Oklahoma City, has opened a machine shop in Arp, Tex., equipped for all kinds of drilling, production and pipe line work. It also has opened a supply store there and is stocking a complete line of drilling and production specialties. The company is planning to open a store in Willow Springs, Tex.

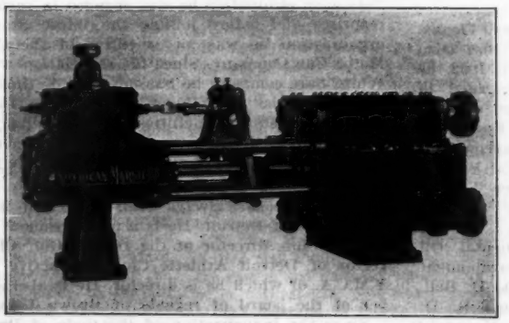
AMERICAN-MARSH PUMPS DESIGNED FOR REFINERY USE

The American-Marsh piston pumps, made by the American Steam Pump Co., Battle Creek, Mich., are especially designed for oil-refinery applications. All bushings are renewable, and can be replaced in minimum time. All stuffing-boxes are extra deep to take the maximum amount of packing. All working parts are readily accessible. These three features tend to reduce the attention and maintenance required to keep the pumps in first-class operating condition.



Simplex piston pump, side pot, close-clearance type.

On the side pot pumps, both duplex and simplex types, the pots are located close to the ends of the cylinders, making the distance between the suction and discharge valves and the cylinder barrels short. Also, the fluid pistons at the ends of the stroke travel close to the heads, to reduce to to minimum the clearance in the fluid end. These features permit the handling of gasoline, kerosene, naphtha and other volatile liquids without danger of the pumps becoming vapor bound.



Duplex piston pump, side pot, separate pattern, close-clearance type.

On all side pot pumps, the balanced steam valve and steam chest construction is standard equipment. On the duplex pumps each steam chest is cast integrally with its steam cylinder, eliminating the necessity for placing a gasket between them, and effectively preventing any live steam from blowing out through the exhaust ports.

On all the pumps the piston rods are split at the crosshead. This permits the replacement of either half of the piston rod as necessary, as against the installation of a complete new rod. It also enables the manufacturers to build the fluid end half of the piston rod of the material which best meets the operator's individual requirements.

COMBINATION TAPE AND RULE IS HANDY DEVICE

The Crescent tape-rule, a 6-foot measure, combining the convenience of a pocket tape and the utility of a rule, has been brought out by the Lufkin Rule Co., Saginaw, Mich. This device, useful in many branches of the oil industry, is an

accurate steel tape that automatically winds into a sturdy case only 2 inches in diameter, yet, when withdrawn, is rigid like a rule. "Crescent" No. 693 is marked inches to sixteenths. No. 696D is marked feet, tenths and hundredths of feet, i.e., engineers measure. It is handy to use and easy to carry in the pocket.

The line or rule blade is of high quality tempered steel, stiffened by special forming. It is nickel-plated and has prominent dark markings. Unsupported, it may be projected like a rule. It will also flex around and accurately measure circular, round-cornered and other shaped objects. Measurement is taken when outer end is projected against any object, and the solid clip at first end serves for withdrawing the rule blade from the case and also as a hook for taking measurements out of arms reach. The case is chromium-plated and has a smooth-working, spring-winding device, with ratchet stop.

The rule blade, being manually withdrawn and automatically returned, is always under control. A simple pressure on a push button recoils it in the case quickly. The Lufkin Crescent is sold at hardware and tool stores, engineering supply and factory supply houses.

BUDA OBSERVES ANNIVERSARY

This year marks the fiftieth anniversary of the Buda Co., Harvey, Ill., whose products, which include drilling and pumping equipment, compressors, ditchers, hoists, etc., are known throughout oil fields of the world. Established in 1881, the Buda Co. started in a modest way in Buda, Ill., as a manufacturer of railroad supplies. In 1891 the factory was moved to Harvey. Today its employes number approximately 1,500 and the shops occupy 500,000 square feet of floor space. In 1910 the possibilities of a rapid development of the automotive industry were recognized by the management, and it was decided to enter this field with a line of high quality gas and gasoline engines. In 1926 the company began the manufacture of Buda M.A.N. Diesel engines for industrial equipment, generating sets and power units for various portable and stationary requirements and a large new factory building with new equipment throughout was provided for this purpose. Branch offices are maintained in New York, Chicago, St. Louis, San Francisco and Wembley, Middlesex, England.

Personal Paragraphs About Oil Men

J. C. Barden, National Carbon Company, New York, was in Tulsa during the week on business.

* * *

John T. Hayward, consulting petroleum engineer, has just returned to Tulsa after a business trip to Milwaukee and Chicago.

* * *

Frank H. Reed, of Neosho, Mo., well known oil operator, has been ill for some time and has gone to the Mayo Clinic at Rochester, Minn., for an examination.

* * *

Joe C. Hemphill, scout for the Vacuum Oil Company, and Mrs. Hemphill are spending their vacation in Madill, Okla. Mr. Hemphill is located at San Angelo, Tex.

* * *

Harry C. Hanszen, independent oil man, Houston, Tex., who has been spending the summer with his family at their summer home at Big Lake, La., spent a short time in Houston on business.

* * *

B. M. Nowery, general superintendent of the United Production Corporation, Houston, Tex., accompanied by Mrs. Nowery and family, is spending a vacation motoring to northern Montana.

* * *

M. A. Lowrance, a land man, with the Sinclair Oil & Gas Company at Fort Worth, Tex., has been transferred to Tyler, Tex., where he will continue as a member of the land department.

* * *

S. C. Graham, of the Graham & Loftus Oil Company, is acting president of the Independent Petroleum Association of California, following the resignation recently of A. T. Jergins, former president and director.

* * *

R. M. Barnes, chief geologist of the Continental Oil Company, delivered a brief outline of the geology and history of development of the Kettleman Hills Field before the Los Angeles Petroleum Accountants Society.

* * *

Paul G. Benedum, of Elmira, N. Y., representative of the Benedum & Trees interests in the Tioga gas field in Pennsylvania, has gone to Texas. He will have charge of the same firm's oil and gas interests in that State for a time. Mr. Benedum expects to return to Elmira in four months.

* * *

Ted Miles, formerly superintendent of field operations for the Union Oil Company, at Orcutt, Calif., has been placed in charge of all field operations in the San Joaquin Valley and Coast fields, with the title of assistant general superintendent of the northern division, reporting to Lafe Todd, general superintendent of the division. His headquarters are at San Luis Obispo.

* * *

Emil Furst, of the Vacuum Oil Company, Vienna, has been appointed general manager of that company. He is in his forty-seventh year. In 1902, he joined the Olex Company, and was engaged in Germany, Belgium and Holland. Later he was for more than 10 years with the Galizische Karpathen interests. In 1922, he took over the management of Gustav Konig & Company's benzine plant at Vienna-Kagran; and this firm was taken over by the Vacuum.

* * *

E. J. Nicklos, vice president, Continental Oil Company; L. P. Carpenter, general superintendent of the Oklahoma and Kansas division; A. H. Bell, superintendent of the California division; R. H. Shannon, superintendent of the Rocky Mountain division; and George McIntyre, Fort Worth, Tex., superintendent of the Texas, New Mexico, Arkansas and Louisiana division, left Ponca City, Okla., on an automobile trip that will consume two and one-half months, carrying them to various parts of the country where the company has production and leases. The trip was planned by D. J. Moran, president of the company, with a view of effecting economies in operation.

Guy P. Slater, of the Slater Derrick Company, Sand Springs, Okla., left for Tyler, Tex., and will spend considerable time in that area.

* * *

Mr. and Mrs. Harry W. Lackey announce the birth of a daughter, Ann Weaver. Mr. Lackey is connected with the Oil Well Improvements Company, Tulsa.

* * *

J. F. Corcoran, special oil field representative of the Trimont Manufacturing Company, Boston, Mass., accompanied by Mrs. Corcoran and daughter Jane, have left for a two months' trip home and to the factory.

Men of the Industry

Howard A. Coffin

The recent promotion of Howard A. Coffin to the presidency of the White Star Refining Company did not come as a surprise to his numerous friends in the refining and marketing branches of the oil industry. As vice president and sales manager of the White Star, the company has become one of the largest independent marketing organizations of the oil business.

Mr. Coffin is a graduate of Brown University. Following graduation he was engaged in various enterprises and before joining the White Star sales organization he was an executive of the Cadillac Motor Car Company. Since his association with the White Star company he has devoted his time largely to the sales end. Under his direction, the bulk and service station facilities of the company have been expanded to take care of a steadily increasing refinery output. The company's refineries are located at Wood River, Ill., and Trenton, Mich.

Mr. Coffin has always been interested in civic enterprises of Detroit. He is a past president of the Rotary Club, director of the Detroit Golf Club, director of Detroit Athletic Club and active in the Y.M.C.A. of which he is director. He is also a member of the board of regents of Brown University.

Since the inauguration of the Code of Practices for Marketing Refined Petroleum Products, Mr. Coffin has been chairman of the Michigan committee. As president of the White Star company, Mr. Coffin succeeds H. B. Earhart, founder and for 21 years the active head of the company. Mr. Earhart, who was recently elected a director of the Vacuum Oil Company, will continue to devote part of his time to the White Star company. He has been elected chairman of the board of directors.

Wallace W. McIlhany was re-elected secretary-treasurer at the annual meeting of the California Natural Gasoline Association.

* * *

C. A. Prichard, purchasing agent of the Mid-Continent Petroleum Corporation, has returned from a business trip to Iowa, Illinois and Missouri.

* * *

W. W. Blocker, assistant to the president, Houston Oil Company, Houston, Tex., and Mrs. Blocker, are spending a vacation in Pasadena, Calif.

* * *

L. C. Hays, sales representative of the Marathon Rubber Company, Akron, Ohio, called on oil company buyers and others in Tulsa on a trip to the Southwest.

* * *

William H. Mohr, chief engineer of the Edwards Valve & Manufacturing Company, East Chicago, Ind., was a recent visitor at the office of the Taubman Supply Corporation.

* * *

L. P. Garrett, vice president of the Gulf Production Company, Houston, Tex., and family, have left for their summer home in Winslow Park, Ark., where Mr. Garrett will spend a vacation.

* * *

Otto Bradford, proration umpire at Oklahoma City, has been spending a few weeks in a Tulsa hospital. Mr. Bradford has been ill for several months and only recently returned from a visit in Hot Springs, Ark.

* * *

E. T. Knudsen, of the Petroleum Economics Division, United States Bureau of Mines, was in southern California checking up refinery operations but has returned to the department's West Coast office in San Francisco.

* * *

Dr. Gordon Scott, American Petroleum Institute research associate, Bureau of Standards, Washington, D. C., has arrived in Los Angeles, Calif., and is delivering a paper on inspection and test of pipe line coatings in the auditorium of the Los Angeles Gas & Electric Company.

* * *

W. F. Clark, formerly with the Indian Territory Illuminating Oil Company, will succeed A. B. Capers as proration umpire in the Lathrop district in the East Texas Field, July 1. Mr. Capers, who has held the position since proration went into effect May 1, will return to his home in Midland, Tex.

* * *

W. W. Cromley, for many years identified with the internal combustion engine industry, has joined the Hercules Motors Corporation staff of sales representatives, while Harry E. Blasingham has recently been appointed general purchasing agent in entire charge of all Hercules purchases and stores.

* * *

William J. Healey, of Bradford, Pa., president of the Healey Petroleum Corporation, has been elected president of the Bradford Hospital Association. This is a recognition of Mr. Healey's civic usefulness, the post having always been filled by an outstanding citizen of the famous old eastern oil town.

* * *

Roy Lundy, secretary and treasurer of the Tulsa Rig, Reel & Manufacturing Company, Tulsa, was struck in the eye with a golf club and the eyeball so severely injured that it was necessary to remove it from the socket. Mr. Lundy is reported resting comfortably now but it will be a month before he will again be back at his office.

* * *

The Naft, the Anglo-Persian Oil Company's house organ, contains a time-table of Sir John Cadman's recent journey from London to Iraq, Persia, Palestine, Egypt, and back to London. The longest stay was made at Bagdad for the Iraq Petroleum negotiations. The total mileage was 10,238, 2,658 miles by rail, 2,502 miles by boat, 880 miles by road, and 4,198 miles by air. The longest single day's journey by air was 600 miles, Bagdad-Rutbah-Ramla-Jerusalem.

Natural Gas Industry Developments

NATURAL GAS OUTPUT GAINS IN THREE STATES

The number of users of natural gas in the three large producing states of California, Oklahoma and Texas was multiplied more than six times from 1920 to 1930, according to figures compiled by the respective state departments having jurisdiction over the industry, while production of natural gas was increased nearly four times.

The combined production in the three states in 1930 aggregated about 1,015,000,000,000 feet, as compared with 256,000,000,000 feet in 1920. The number of consumers in those states was 319,306 in 1920 and 1,958,014 in 1930.

About eight times as much natural gas was produced in California in 1930 as was produced in 1920, according to a statement issued by the State Railroad Commission, and the number of consumers during the same period increased from 95,000 to more than 1,311,000.

Production of natural gas in California has increased from a total of 68,650,000,000 feet in 1920 to 554,637,000,000 feet in 1930, while the mileage of transmission lines jumped from 980 miles in 1920 to more than 3,000 miles in 1931, according to a report compiled by Claude C. Brown, chief gas and electric engineer of the railroad commission.

The distribution of natural gas in Texas increased about five times from 1920 to 1929, according to reports filed with the State Railroad Commission, while the increase in the number of consumers was almost in the same proportion.

The distribution of natural gas in Texas increased from 21,667,407,050 feet in 1920, the first year in which the gas utilities division of the railroad commission compiled reports, to a total of 103,021,902,000 feet in 1929.

The report for 1929 was compiled September 1, 1930, but covered only the calendar year of 1929. The number of consumers increased from 94,306 in 1920 to 422,014 in 1929.

Natural gas production in Oklahoma was more than doubled in 1929 compared with the output in 1920, while pipe line mileage was multiplied five times, according to figures made available at the office of the State Corporation Commission.

In 1920 the production amounted to 166,265,000,000 feet, while in 1929 it was 357,893,000,000 feet. It was stated that in 1930 the production probably was about 10 per cent greater than in 1929.

The estimated number of consumers in 1922, the first year of which figures were available, was 130,000, while in 1930 this number had increased to 225,000.

The natural gas pipe line mileage in 1920 was estimated at 1,500 miles. In 1930 this mileage had increased to 7,500 miles.

Natural gas production in West Virginia decreased from 161,581,741,000 feet in 1929 to 140,585,401,000 feet in 1930, according to a compilation announced by E. V. Williamson, statistician for the Public Service Commission.

Indicating the development of the Kentucky natural gas fields, a total of 16,222,418,000 feet of gas was imported from the Kentucky fields in 1930 as compared with imports of 11,986,055,000 feet in 1929.

Of the gas produced and imported into the State in 1930, a total of 59,825,254,000 feet was consumed in West Virginia and a total of 96,982,565,000 feet was exported. In 1929 a total of 68,181,724,000 feet was used in the State and a total of 105,386,072,000 feet was exported.

The two largest distributors of gas in the State in 1930 were the Hope Natural Gas Co., with headquarters in Clarksburg, and the United Fuel Gas Co., of Charleston, a subsidiary of the Columbia Gas & Electric Co.

The Hope Co. distributed 56,249,797,000 feet in 1930 as compared with the 1929 distribution of 58,941,989,000 feet. The United Fuel Co. distributed 49,270,013,000 feet in 1930 and 52,671,582,000 feet in 1929.

The United Fuel Co. produced 34,355,018,000 feet in 1930 compared to the Hope company production of 7,507,500,000 feet.

SHAWNEE GAS FRANCHISE ELECTION ON AUGUST 6

The city council of Shawnee, Okla., at a special meeting July 1 voted to submit to the people of Shawnee at an election on August 6, the terms of a franchise offered by Oklahoma Natural Gas Corp. for the service of gas for the next 25 years. Oklahoma Natural offers a rate of 45 cents per thousand feet for the first 100,000 and 18 cents per thousand for each 1,000 thereafter. It also agrees to pay a tax of 2 per cent of the gross receipts and give free to the city for municipal uses, gas to the amount of 5,000,000 feet per year.

This action of the city council followed the submission the previous night of a similar franchise offered by Western Service Corp. for the same election date. The city council decided to put the Oklahoma Natural franchise on the ballot following numerous protests from the citizens of Shawnee against the tearing up of the city streets in the event a franchise was granted to a company competing with Oklahoma Natural.

The franchises are practically the same in terms except that Western Service Corp.'s contains a provision that its franchise can be sold within five months from the date of passage by the voters.

The Western Service offered to pay the city 5 per cent of its gross revenues. Under a sliding scale of rates presented by the Western Service Corp., the first 50,000 feet would cost consumers at the rate of 44 cents; the next 25,000 feet 35 cents, and the succeeding 25,000 feet 25 cents per thousand.

The Oklahoma Natural has served Shawnee for 25 years. The Western Service Corp. agreed to have its distribution system installed within 90 days.

OKLAHOMA NATURAL GAS NAMES RATE ENGINEER

Frank C. Strong, statistician for the Oklahoma Natural Gas Corp., Tulsa, has been appointed rate and industrial reports engineer for that company, according to an announcement by E. A. Olsen, executive vice president.

The appointment of Mr. Strong to this position is in line with the company policy of helping communities served in planning industrial expansion. Mr. Strong will handle all matters pertaining to rates, rules and regulations governing Oklahoma Natural service. He will also prepare rate studies with special regard to industrial requirements. He will be available also for the study of the industrial possibilities of the various towns served and for the preparation of reports in connection with such studies. This work will be done under the sponsorship of the local chamber of commerce or city council and will be done without charge as additional service by the Oklahoma Natural to the communities served. Mr. Strong, who is a graduate of the University of Nebraska, came to the Oklahoma Natural in 1930.

UNITED GAS UNITS CUT IN SIMPLIFICATION PLAN

The United Gas Corp. has simplified its system by reducing the number of constituent companies from 42 at the time of organization last July to 16 on June 15, Ralph B. Feagin, president, told stockholders at the annual meeting.

In the process of simplification of accounting, operating and financing work the United Gas Corp. has issued about $42,000,000 in preferred stock for the preferred stocks, bonds and debentures of underlying companies, Mr. Feagin said. At the same time United Gas has maintained a $20,000,000 expansion program for its first year of operations.

The major details of the program have been the tying together of the many disconnected systems that were brought into the United Gas Corp., the furnishing of natural gas service to new territory in the Gulf states, and the increase in capacity to supply leading southwestern cities.

"Although the business depression was at its worst while this construction schedule was carried out, the system has met this condition and has contributed its part to help industry in the company's territory get on its feet," Mr. Feagin said. "We have been in position to get our costs down and to sell gas to industries at lower prices."

The system comprises the United Gas Corp., controlled by Electric Power & Light Corp. as holding concern for the properties; the United Gas Public Service Co., the principal operating unit of the system, and 14 subsidiaries that are 98 per cent to 100 per cent owned and which are to be merged or otherwise liquidated.

Permanent financing is already under consideration, F. A. Farrar, vice president of the Electric Bond & Share Co., told stockholders. The first plan is to sell $20,000,000 of the United Gas Public Service Co.'s $6 preferred stock to customers in the territory served beginning this fall. This is to be followed by an issue of first mortgage bonds, probably $50,000,000, to cover the whole structure. This will entail retirement of some remaining funded debt of underlying companies and will be undertaken later.

By May of next year, after construction schedules and permanent financing have been completed, the consolidated funded debt of the United Gas Corp. will be around $75,000,000. Nearly a year ago the company had 6,100 preferred and 11,200 common stockholders, while now there are 7,284 preferred and 20,787 common stockholders.

Of the $28,000,000 gross revenue of the United Gas System in the year ended April 30, $23,000,000 came from sales of natural gas, $1,200,000 from gasoline, and $2,800,000 from oil, the balance being due to carbon black, oil refinery and miscellaneous revenue. The company is liquidating its carbon black and oil refinery operations.

Sidney Z. Mitchell, chairman of the board, said he believed the reserves and output of the United Gas Corp. were the largest of any single group in the world, while production costs and prices were the lowest.

N. C. McGowen, president of the United Gas Public Service Co., described the system and its many connections with other natural gas, pipe line and distributing companies in the Southwest which deliver gas to St. Louis, Memphis, Birmingham, Atlanta and Little Rock. The company itself distributes gas throughout the Southwest, from Laredo to Pensacola, and north to Oklahoma, northern Texas and northern Louisiana.

Mr. McGowen made the point that, although the system covered many hundreds of miles in the Southwest at no place was there more than 200 miles distance between its gas fields and the ultimate consumers of natural gas. Because of the increased use of natural gas for generation of electricity, Mr. Mitchell added, this gave a great extension to the territory to which the benefits of a cheap and plentiful natural gas supply were available.

OKLAHOMA CITY FIELD GAS SUPPLY UNCERTAIN

Action of the Oklahoma City council in approving a report of a special committee favoring submission of a bond issue of approximately $4,000,000 to purchase or construct a municipally owned gas distribution plant has raised the question of a suitable supply for such a system. Hubert Bale, Oklahoma City, geologist, 18 months ago filed a report estimating that the Oklahoma City gas field, from which it is proposed to secure gas for a municipal system, offered a supply for 1,017 years. This report was filed in response to a request from former City Manager E. M. Fry.

Mr. Bale has just filed a supplemental report declaring that since the original report was filed there have been radical changes in the field. He states that his former report is being used as a basis of a move for a municipally owned gas system. After enumerating changes that have occurred in the field, Mr. Bale says: "On account of the above facts I am now of the opinion that, while the Oklahoma City Field is one of the greatest oil fields in the country, it is not primarily a natural gas field, and cannot be considered a source of supply for pipe lines in addition to those now in operation. This is particularly true when consideration is given to the fact that many millions of barrels of oil must of necessity be lifted by natural gas, which will certainly eventually be taken from the shallow sands or be supplied to the fields by pipe lines now taking gas from the field. Because of the probability of the enormous demands of the gas reserves by operating pipe lines and oil producers in the field, I am firmly of the opinion that neither Oklahoma City nor any other city can rely on the Oklahoma City Field solely for its natural gas requirements."

TEST IN CITY FAILS

KANSAS CITY, Mo., July 6.—A gas drilling rig between the Lavon and the Leverne apartments, 906 East Thirtieth Street, has been dismantled after a 730-foot hole had been drilled.

The well was started 30 days ago by the Kansas City Building Co., owners of the property. A small amount of gas was found at 340 feet.

GAS EXTENSION PLANNED

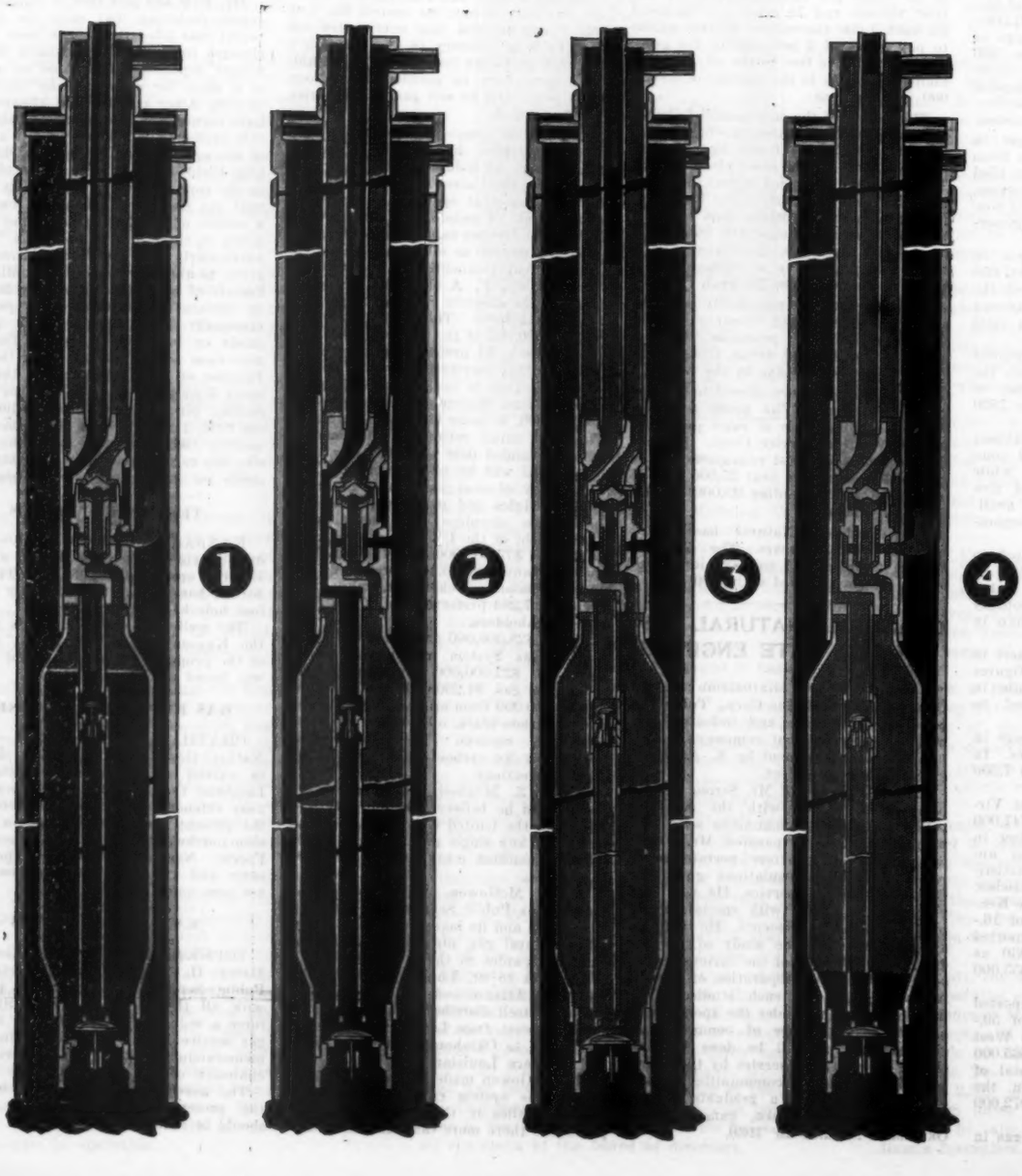
CHATHAM, Ontario, July 6.—Union Natural Gas Co. of Chatham is planning to extend its distributing system in Lambton County. The system was last year extended to include Alvinston, and the present plans contemplate an extension northward to Watford, Arkona and Forest. Negotiations between the company and the municipalities concerned are now under way.

KANSAS GAS RATES

TOPEKA, Kans., July 6.—Governor Harry H. Woodring has directed the Public Service Commission to proceed with all the resources of the State to force a reduction in the rate for natural gas service in the State, according to a memorandum sent to Jesse W. Greenleaf, chairman of the commission.

The governor stated that he believed the present 40-cent city gate charge should be reduced to 25 cents.

"JAL"



Gas off
Displacement Pump Valve
Flow Tube empty
Chamber exhausting Gas
Standing Valve open
Eduction Tube Valve open
Chamber filling with Oil

PUMPING SYSTEM

A most efficient method for pumping wells of any depth. Records from 7,000 and 8,000-foot wells, in domestic and foreign fields, show that the JAT Pumping System gives a remarkably low lifting cost, due to its long, continuous trouble-free service, low maintainance cost, and freedom from mechanical difficulties.

Descriptive Bulletin sent on request.

NATIONAL SUPPLY COMPANIES

CYCLE OF OPERATION

View 1

Valve closed
Gas
Valve open
Valve open
Oil

View 2

Gas being injected
Displacement Pump Valve open
Relief Port closed
High Pressure Gas entering Chamber
Standing Valve closed
Oil forced up Flow Tube
Eduction Tube Valve open

View 3

Gas being injected
Displacement Pump Valve open
Relief Port closed
High Pressure Gas flowing through Chamber
Standing Valve closed
Eduction Tube Valve open
Piston of Oil displaced

View 4

Gas off
Displacement Pump Valve closed
Chamber exhausting Gas
Eduction Tube Valve closed
Gas in Flow Tube expanding
Piston of Oil traveling towards surface
Standing Valve open
Oil filling Chamber

Technical Questions Answered

BY CHARLES K. FRANCIS, PH.D., TECHNICAL EDITOR

This department of The Oil and Gas Journal is devoted to the manufacturing branches of the oil industry.

Those connected with the refining of crude petroleum, the manufacture of natural gasoline and closely allied industries are invited to submit their problems to Dr. C. K. Francis, technical editor. The department was created for the purpose of aiding managers, superintendents, engineers, chemists and all those engaged in the various phases of plant operation; also those connected with the marketing and utilization of petroleum products.

Questions should be submitted in as much detail as possible so as to assure a satisfactory answer.

All inquiries should be signed and if other than the given initials are to be used please indicate the desired letters.

Questions involving patented processes, intricate formulas and calculations and estimates of costs, for obvious reasons, cannot be answered. The replies will appear on this page within a reasonable time.

LUBRICATING OILS FROM CRACKED DISTILLATES AND WAX

Do you have any details about the process and quality of the lubricating oils recently announced by the Standard Oil Co. of Indiana? These oils are reported to be low cold test oils made by an entirely new process.—D. L.

A synthetic method for the manufacture of high grade lubricating oils from cracked distillates and wax stocks was described in a paper before the 1931 spring meeting of the American Chemical Society, by F. W. Sullivan, Jr., V. Voorhees, A. W. Neeley, and R. V. Shankland of the Standard Oil Co. of Indiana. This paper was published in Eng. Ind. Chem., 23, 604, 1931; also The Oil and Gas Journal, June 4, 1931, page 26. The abstract following has been prepared from these articles.

These investigators decided that the change of viscosity of an oil with temperature, its temperature coefficient of viscosity, is a fundamental property of the substances, hydrocarbons, of which it is composed. The viscosity index of Dean and Davis provides a means for indicating the temperature coefficient of viscosity. The viscosity index is explained by Dean and Davis in Chem. Met. Eng., 36, 618, 1929. See also this page, November 20, 1930. It is a coefficient derived from Saybolt Universal viscosities at 100° and 210° F. The viscosity index of an oil having a viscosity of 60 at 210° F. and 600 at 100° F. is 51.

Mineral oils having low temperature coefficients of viscosity, low vapor pressures for a given viscosity, and low densities are said to be paraffinic, and those at the other extreme naphthenic. These properties are inseparably related, suggesting that they are the common result of the presence in the oil of a certain type of hydrocarbon. That is, there is a close relation between chemical structure and the temperature coefficient of vicosity of lubricating oils.

A systematic investigation of lubricating oils made by the polymerization of olefines with aluminum chlorine, 3 per cent by weight, was conducted. The oil was agitated with the catalyst, at 130-135° F., for 30 hours. After polymerization and separation of the sludge, the oil was washed with sodium hydroxide solution and then with water, reduced to the desired viscosity with fire and steam, and finally filtered through clay.

It was found that the temperature coefficient of viscosity of the polymers decreases with increasing molecular weight of normal olefines and increases with increasing branching of the chains for isomers. The extreme range covered corresponds to a viscosity index of from 140 to less than —300.

It appears that when running gas oil charging stocks, the more paraffinic the stock the better is the temperature coefficient of viscosity of the oil. The oil from refined wax possessed a lower temperature coefficient of viscosity, a higher gravity, and a lower pour test than any oil made from known crudes. Also the yields of viscous oil were better when charging stocks containing higher percentages of wax were used.

The physical properties of two synthetic oils produced in this study are shown in the table.

SYNTHETIC OILS AS PREPARED

Gravity, A.P.I.	30.6		29.7	
Flash, °F. (°C.)	515	268	615	324
Pour, °F. (°C.)	−20	−28.9	0	−17.8
Viscosity—				
Say. Univ. at 100° F. (37.8° C.)	850		3,250	
Say. Univ. at 210° F. (98.9° C.)	85		197	
Color, N.P.A.	2		2½	
Conradson carbon, pct.	0.13		0.4	
Slight oxidation, mg. sludge/10 gms. oil	1.8		2.8	

Since no wax is produced in the polymerization, these synthetic oils are wax-free and consequently their pour tests are in direct proportion to their viscosity temperature coefficients. As these are low, the pour tests are also low.

QUALITY OF GAS FOR BOTTLED GAS

I enclose a chemical analysis of natural gas taken from a well in which I am interested. I wish you would kindly let me know, in your estimation, if this can be bottled, transported and sold in containers at a profit and what distance it could be transported based on a production cost of 3 cents per 1,000 cubic feet?—A. M. D.

The analysis submitted includes this information: Specific gravity 0.559, methane and ethane 94.1 per cent, nitrogen 4 per cent. Heating value 1,002 B.t.u. per cubic foot.

The specific gravity of pure methane is 0.554 and its heating value is 1,003 B.t.u. per cubic foot. These facts, together with the analysis, suggest that the gas is essentially methane.

The gas now being compressed and distributed in cylinders and tank cars to be used for fuel or other purposes, is largely propane with smaller quantities of butane. These hydrocarbons are extracted from suitable natural gas, and some refinery gas, then reduced to the liquid condition under high pressure. The hydrocarbon remains in the liquid condition so long as the pressure is maintained. Regulators are attached to the cylinders so that the gas will be released at a definite pressure.

It appears, from the analysis submitted, that this gas does not contain the hydrocarbons required for the preparation of bottled gas. The usual source of propane and butane is what is termed wet gas, a gas used for the manufacture of natural gasoline, and these hydrocarbons are too volatile to be included in the stabilized gasoline so constitute a by-product which is burned or simply wasted. There are large volumes of propane available for the preparation of liquefied gas but the cost of distribution is so great that the business does not seem to be profitable except in the territory quite close to the supply.

There are too many features involved to permit a complete analysis of the conditions involved in all the phases of this business in a short article. Of course the most important factor is the volume of business that can be done without requiring a large investment in cylinders, etc., and without having to pay out large sums for transportation.

ANILINE POINT FOR TESTING NAPHTHAS

What is the significance of the aniline point of a petroleum naphtha? The test referred to is that of "specifications for petroleum naphtha" in A.S.T.M. Tentative Method of Test for Precipitation Number of Lubricating Oils, D 91-30 T. Reference: A.S.T.M. Report of Comte. D-2 on Petroleum Products and Lubricants, page 266. I find no other reference to aniline point as a test method in the literature and would appreciate bibliographical assistance.—E. C. H.

See this page in the issue of April 9, 1931, answer to L. H. O. Several references may be obtained from the article by Howes, J. Inst. Pet. Tech.; 16, 54, 1930.

The original investigators of this test were Chavanne and Simon, who wished to use it for the purpose of obtaining the quantity of aromatic and saturated cyclic hydrocarbons in gasoline and lighter petroleum distillates. The record of their work may be found in Compt. rend. 1919, pages 169, 170, 185, 693; also J. Soc. Chem. Ind., 1919, pages 619A, 672A, 889A. The critical temperature of solution is determined on a portion of the original sample and also on another portion that has been nitrated, and washed with sulphuric acid for the removal of the aromatic hydrocarbons. These two temperatures being represented by t_1 and t_2, the aromatic hydrocarbons content is found by

$$Ar = k(t_2 - t_1).$$

Within the past few years there has been an increased demand for the special petroleum naphthas by manufacturers as a solvent and diluent for the preparation of paints, lacquer and varnish. When used in this way it is important that the purity of the naphtha be known and the critical temperature of solution of a mixture of naphtha and aniline makes a simple and convenient test for this purpose.

Lacquer diluents of the petroleum type have been studied by J. R. Stewart, Cir. 378, American Paint and Varnish Manufacturers Association. He has prepared a statement of the method for determining aniline point as used when investigating these naphthas. The description is based on this source.

In a 6-inch test tube place 3 c.c. of freshly distilled aniline, then add 2.5 c.c. of the sample, measured from a pipette or burette. Warm this mixture over hot water or steam, to just above the temperature at which a clear solution appears. Insert this tube into an 8-inch tube holding about one-third water at a temperature nearly the same as the mixture. Fix this in a stand and suspend a thermometer, encircled with a bent copper wire stirrer, in the mixture. Allow to cool slowly, at the same time agitating with the wire in an up and down motion and read the temperatures to the nearest 0.5° C. at which the solution clouds. This point is sharp and clear. Add 0.3 c.c. more of the naphtha and repeat, alternately continuing agitation and reading the temperature. Add another 0.3 c.c. and repeat. These three trials should give at least two trials differing by less than 0.5° C. The highest temperature is the aniline point.

The aniline must be fresh and clear, as old aniline may give errors as much as 2° C. Moisture in the aniline tends to high temperatures. The size of the sample of aniline is adapted to give easy manipulation without danger of temperature differences within the liquid. For this reason it may be stated that the aniline point usually occurs at about equal volumes of the naphtha and aniline. The aniline point of a high grade petroleum naphtha should not be higher than 60° C.

MOSS GROWTH IN COOLING TOWERS

What method of removing moss and other organic growth from cooling towers is being practiced? The tower is supplied with softened well water. Moss has collected over the baffles in the tower. This moss collects only in the hot months.—R. L. G.

One method found to be efficacious for controlling growth such as algae and mosses in water reservoirs, is to introduce a small quantity of copper in the form of copper sulphate, (blue stone). Similar treatment will probably give good results for preventing the green moss from collecting on the baffles of a cooling tower.

The copper sulphate, say about 50 pounds, may be placed in a burlap sack which is set in one corner of the sump, preferably protected from the splash and spray. The idea being that the copper sulphate will go into solution very slowly, so that a mere trace of the chemical will be distributed through the system and over the baffles.

Another scheme, should growth of this character appear, is to "wash" the baffles occasionally with steam. However, this may be expensive, both in labor and steam, and does not seem to be as effective as the copper sulphate treatment.

Growths of this sort do not often appear on treated or painted wood. Wood may be impregnated with creosote or some other preservative. Painting is commonly practiced when the green growth is especially objectionable.

TESTING NATURAL GAS FOR FREE SULPHUR

Do you have a method for testing natural gas for free sulphur content? I would appreciate some suggestions concerning this.—G. D. R.

I do not know of any natural gas containing free sulphur. Some free sulphur might be found in gas close to the source and possibly in gas found adjacent to a sulphur deposit, or the result of chemical reaction when large quantities of hydrogen sulphide are present.

If existing in the gas free sulphur would have to be in an exceedingly finely divided form. It may be separated from the gas, if present, by filtering through a tared Gooch filter, or some other suitable filter, and weighed after drying at 212° F. If desired the residue on the filter may be dissolved in carbon disulphide, the solution evaporated on a steam bath in a tared dish, and the dried residue weighed as sulphur.

Whatever the analytical procedure, the sample would have to be measured in terms of cubic feet.

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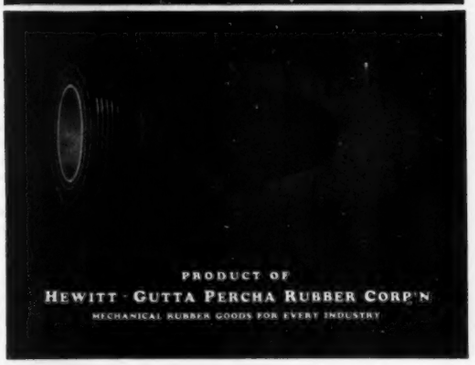
Pressure - Pulsation - Abrasion All in a Day's Work for Maltese Cross No. 1642 Rotary Hose

The new Maltese Cross Rotary Hose is a revolutionary step in hose durability. Built to give economical, uninterrupted service. Withstands mud erosion, oil, pulsations and the excessive pressures encountered in drilling to the present-day extreme depths. Note its rugged construction . . . its special combination wire reinforcing . . . its outside protection of spiralled duck tape.

There is a specific Hewitt-Gutta Percha rotary hose for every class of drilling condition: *Maltese Cross* No. 1642 for the highest pressures; *Monarch* No. 1139 and *Ajax* No. 1728 for less strenuous jobs.

Cut drilling costs — insist on highest quality — specify Hewitt-Gutta Percha.



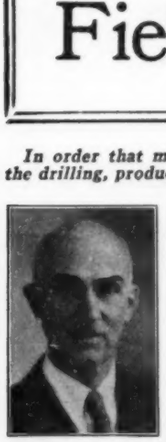
OIL FIELD DISTRIBUTORS

OIL WELL SUPPLY CO.

Field Problems and Their Solution

EDITED BY THOMAS F. SMILEY

In order that men connected with the drilling, producing and transporting branches of the petroleum industry may procure quickly a solution of many problems confronting them from time to time in their work, The Oil and Gas Journal has arranged with leading engineers and other recognized authorities to answer questions submitted by readers of this publication pertaining to the work of drilling and producing crude oil and transporting this product.



Everyone is invited to submit questions freely. These questions will be submitted to proper authorities by Mr. Smiley, who edits the page, and answers, based on the best available information, will be published. Each question should give as much detail as possible, especially where it relates to matters where depths of sands, types of sands and operations on adjoining properties would have a bearing on the problem involved. The source of all questions will be considered as confidential and only initials will be published in connection with the question.

In this connection, The Oil and Gas Journal will be glad to publish articles from field men who have devised new methods or practices which are improvements.

In case an immediate answer is important, one will be given by mail if the writer requests it.

MORE ABOUT PIPE STRETCH

The following interesting letter has been received from V. N. Andreev, engineer in the production department of the International Petroleum Co., Negritos, Peru:

"With reference to the question of E. L. W. regarding the stretch in a suspended pipe, discussed in the Field Problems page of The Oil and Gas Journal of March 12, 1931, it might be pertinent to add a few remarks. The formula for the stretch of a freely hanging steel rod (or pipe, as the stretch depends solely upon the cross-sectional area irrespective of its shape) is:

$$\text{Stretch in inches} = \tfrac{1}{2}\,\frac{l^2\,w}{E}$$

l = length in inches.
w = weight of 1 cubic inch of steel, about .284 pound.
E = modulus of elasticity, 30,000,000 pounds per square inch.

"The ½ has to be introduced as the effect of such a distributed load, as its own weight is cumulative and reaches one-half of the effect of a load concentrated at one end but equal to total weight.

"The formula agrees with the graph you used in replying to E. L. W.'s question, e.g., for 4,000 feet stretch it is 10.8 inches according to both.

"The same applies to a string set and freely standing, provided the space between the hole and the string is small enough to make buckling negligible. However, such is not quite the case. Therefore, should we apply tension to a casing cemented at the bottom and standing freely the observed stretch might exceed the value according to:

$$\frac{\text{Pull} \times \text{length of string (inches)}}{\text{area (square inches)} \times E}$$

owing to straightening.

"On the other hand, should the casing be tight in the hole or frozen, and were we to rely upon the stretch observed to guard against setting up an excessive pull (not having provided means of measuring the pull directly) we might part the casing, though the stretch observed might be much shorter of a value safe for the whole length, as it would be derived from the part above the frozen point only.

"In questions of stretch or stress of pipe due to its own weight there is no necessity to consider the cross-sectional area (or weight per foot), as it influences the load as much as the resistance. The method of figuring the ultimate stress from the maximum length as cited might be misleading. In the example considered the string is understood to have parted from its own weight if 11,000 feet long.

"The ultimate stress = 11,000 feet × 12 × .284 pound per square inch = 37,488 pounds per square inch.

"According to the A.P.I. specifications for seamless tubing the ultimate tensile strength in pounds per square inch is as follows: Grade A, 48,000; Grade B, 70,000; Grade C, 75,000.

"It might be that the 5,500 feet as maximum length allowable with a safety factor of 2 was meant against collapse and not parting in tension, as 37,488 pounds per square inch seems to be rather low. It is true, however, that the A.P.I. figures refer to the material and not to the pipe (joints).

"It is detrimental to steel to be subjected to stress above its limit of elasticity, a point usually accepted as one-half the ultimate stress. Therefore, should the 37,488 be the breaking stress, the pipe ought not to be subjected to more than 18,744 pounds stress per square inch. A pull of 18,744 pounds per square inch would impart to 4,000 feet of 6⅝-inch casing, if applied at the end a stretch expressed as follows:

$$\frac{\text{Stress} \times l}{E} = \frac{18{,}744 \times 12 \times 4{,}000}{30{,}000{,}000} = 30 \text{ in.}$$

"The cross-sectional area being 9.741 square inches, a pull of 82 tons (2,240 pounds to the ton) would be necessary. For strings of 4,000 feet it is usual to accept a safety factor of 1½ to 2 in collapse and of 4 in tension.

SIZING UP A GAS FIELD

I am offered a proposition to develop a natural gas field of 10,000 acres. One well in this area, drilled 18 months ago, shows an open flow of upwards of 2,000,000 feet per day at a depth of 97 feet, with a pressure of 16 pounds. Since completion approximately 10,000 feet per day has been consumed for domestic and other purposes. Three other wells in this field at the same depth have not been measured. Are there any records of longevity for shallow wells such as these? Would it be advisable to drill a well on each 20 acres in developing this field?—G. E. L.

In a matter of this kind it is essential that fuller information be provided. If the original pressure and well capacity are known it is possible to estimate the quantity of gas in the reservoir if a second reading is obtained at the well showing the new pressure and capacity. This method was illustrated in an answer on the Field Problems page of May 14, 1931. With these data it would be possible to make an estimate that would answer your first question, after which it would not be difficult to determine how many wells would be necessary to drain the pool profitably.

It is suggested that you consult a competent geologist about this problem for it is easy to invest money in a thing of this kind only to find, when too late, that many conditions must be considered if the venture is to be profitable.

STEAM IN FIRE PREVENTION

Your answer to a question from L. N. U. in The Oil and Gas Journal of May 7, 1931, concerning tank explosions resulting from vapors prompts me to ask what the facts are about the value of steam smothering lines for tanks which are used to prevent fires and explosions. I have heard it said that these steam lines are not as effectual as they are supposed to be. Can you tell me the truth about them?—M. N. A.

For years it has been common practice to equip oil tanks with steam smothering lines and to turn steam into the vapor space of tanks whenever it was thought that the tanks might be exposed to some source of ignition, according to M. B. Anfenger, fire prevention engineer, who provides the answer to your question and who says the practice is overvalued.

"A 40 per cent steam concentration is necessary to insure against the presence of an explosive mixture," says Mr. Anfenger. "A 40 per cent steam concentration means that the vapor space must be heated to about 170° F. In the case of a large tank with much outage, it is seldom that a large enough steam supply is available to render the vapor space non-explosive in any reasonable time. Often a tank will appear to be full of steam when a steam cloud is seen issuing from the openings, but as a matter of fact, steam is invisible and the fog which we see at the openings does not mean much.

"Now where the steam supply is inadequate, and for a large tank it usually is, there is not much object in steaming. Again, if the vapor space in the tank is either too rich or too lean to explode, there is little use in steaming. Neither is it desirable to be steaming while there are sparks being produced in the neighborhood because the steam would have to displace some of the vapor from the tank and the vapors are probably safer in the tank than outside of it. This reduces the field for steaming to the few cases where there are small tanks containing an explosive mixture and where there is an adequate steam supply so that the tank can be heated to at least 170° before there is danger of sparks being produced around the tank. In these cases there is still to consider the hazard of steam producing static electricity.

"Under most conditions the danger of a spark from static produced by steam is not great, but if there is an insulated conductor in the tank such as a metal pail or a piece of wood containing nails floating on the oil on which a charge of static can accumulate, there is a serious danger of sparks. I mention a metal pail floating on oil because in more than one agitator fire a pail floating on the oil was regarded as the probable cause. We also believe that it is poor practice in cleaning tanks to introduce water streams into a tank being steamed.

"From the foregoing, it is apparent that steam can seldom be depended upon to either prevent or extinguish tank fires and that under some conditions its use exaggerates the fire hazard. Another objection to steam smothering lines for tanks too large to be afforded protection is the danger that the steam line terminating in the vapor space of the tank can serve as a fuse to convey a fire from any place along the line right into the heart of the tank."

WHY WAS IT CALLED THAT?

SKUNKS

Some Ontario, Canada, petroleums give off an odor as disagreeable as it is penetrating and lasting. Its peculiarly offensive quality led to the name "skunks" being applied to the oil possessing it. The smell is supposed to be caused by combination of a sulphur compound with the hydrocarbons of the oil.

DISPOSAL OF OIL-FIELD BRINES

Has any method of getting rid of salt water from wells become more widely used than the evaporation pond? What are the usual dimensions of these ponds? Are there any particular directions to be observed in making them? What are other commonly used methods of getting rid of salt water?—D.G.F.

The evaporation pond is by far the most commonly used means of handling salt water, mainly because of the comparatively low initial and operating costs, according to Ludwig Schmidt and John M. Devine in a report published by the United States Bureau of Mines. The pits ordinarily have an area of 500 to 10,000 square feet and a depth ranging from 1 to 15 feet. The following recommendations are made in the report:

The evaporation pond should be free from surface drainage.

The evaporation surface should be increased to the maximum possible, and the depth should be held at a minimum consistent with the required storage facilities.

Wind should have free access from all sides.

B.s. and oil should not be allowed to accumulate on the surface of the pond.

The diversion of oil field brines into surface streams is generally prohibited by state laws. However, in some cases—as where a stream is naturally saline, or for other reasons—permission has been granted by state officials for such disposal.

Oil field brines are diverted into surface streams in several of the Texas fields, notably those in Orange and Hardin Counties and the Powell Field. In general all of the operators in the field organize a mutual salt water company. The brines are collected at a central point and then pumped through pipe lines or, where the topography is favorable, are allowed to flow through open ditches to estuaries of the Gulf of Mexico or into river carrying a sufficient volume of water to prevent the addition of the oil field brines from increasing the concentration of salts to a harmful degree.

In several of the southern California fields the salt water is gathered into central pits from which it is pumped through pipe lines to the ocean. In this type of disposal it is necessary that great care be taken by the operators to prevent waste oil from accompanying the brine water. In the Powell Field, each lease is equipped with a series of oil and water separators to prevent oil from being carried into the gathering streams.

Some operators have tried the expedient of returning oil field brines to subsurface formations. This method, however, is not generally used. There is danger of subsequent contamination, even in isolated areas; also the subsurface formation, which may be used as a reservoir, is not always of sufficient thickness and porosity to take the brine at the required rate and at comparatively low pressures. If this method is used, care must be taken that the brines are delivered to a reservoir formation from which migration can not take place with detrimental effect to sources of fresh water supply and to developed or potential oil and gas bearing strata, either adjacent to or at considerable distance from the reservoir.

PIPE LINE TO MONTEREY IS NOW IN OPERATION

(Continued from Page 16)

under the supervision of H. B. Haney, chief engineer; H. W. Wickstrom, assistant chief engineer at Los Angeles, who had charge of the field work; L. T. Trumbull, superintendent of the Belridge-Monterey line, and George C. Thorpe, superintendent of the Santa Maria pipe line.

The line, traversing five counties,

All the collars and corroded sections of the old pipe were cut out with this machine.

Kern, Kings, Fresno, San Benito and Monterey, cost $600,000, of which $32,000 was spent for oxygen and acetylene. Nearly 7 tons of welding rods were used. The total replacement of old pipe, including collars and cutouts, was 8 miles.

With the installation of an electric centrifugal pump at Carneras, and another at Station 2, west of Coalinga, the production is boosted over the top to Station 4. At both Station 4 and 7-A the old steam pumps, with changes in the valves and packing, are used to pump into the storage tanks at Monterey. The capacity of the line at present is 12,000 bbls. daily. With the addition of a booster pump near Coalinga and by changing the pumps at old existing stations to gas engine or electric motor operation, capacity of the line may be increased to 25,000 bbls. daily.

PIPE LINE WALL MAPS ARE NOW AVAILABLE

The demand for copies of The Oil and Gas Journal's latest Pipe Line map has been so insistent it has been arranged to offer a number of wall maps to those desiring them.

These maps, suitable for wall hanging, are 36 inches by 48 inches and show the oil, natural gas and gasoline pipe line systems of the entire United States, each line being identified readily for instant reference.

The price of these wall maps is One Dollar each and they may be obtained at the office of The Oil and Gas Journal, 114-116 West Second Street, Tulsa, Okla.

About to test a section of line by subjecting it to a pressure of 800 pounds per square inch.

WILDCAT OPERATIONS IN KANSAS

(Continued on Page 35)

RAWLINS COUNTY

J. G. Durham et al's No. 1 Weaver, SE cor. Sec. 3-3-35w.. Drlg. 3,501 ft.

RICE COUNTY

Solar Oil Co.'s No. 1 Zink, SE NW Sec. 3-19-10w ..... Drlg. 2,560 ft.
Detrick & Langston's No. 1 Purcell, NW cor. Sec. 33-19-9w ..... Drlg. 2,200 ft.
Cress et al's No. 1 Sharp, SE NE Sec. 13-20-10w ..... Show oil 3,107-15 ft.; Silicious 3,-330-36 ft.; estimated 1,500 bbls.; shut in.
Allison-Fitzwilliams' No. 1 Blake, NE NW Sec. 9-18-10w. Drlg. 1,845 ft.

RUSH COUNTY

Dewey & Mitchell's No. 1 Greenawalt, C SW Sec. 17-19-16w ..... Underreaming 6-in. 3,540 ft.

RUSSELL COUNTY

Agate Oil & Gas Co.'s No. 1 Rochfellow, SE cor. Sec. 6-13-12w ..... Shut down 3,374 ft.
Gilbreath et al's No. 1 Bratton, C NE Sec. 33-11-13w .... Show oil 3,090-94 ft.; shut down 3,504 ft.

SEDGWICK COUNTY

Magnolia's No. 1 McLaughlin, NW cor. 31-28-1w ..... Rig on ground.
Buck et al's No. 1 McNananan, NE NW NW Sec. 2-29-1. Drlg. 2,790 ft.

SALINE COUNTY

Twin Mounds Oil Co.'s No. 1 Weis, C W half NE NW Sec. 20-13-4w ..... Fishing 2,710 ft.

SHERIDAN COUNTY

Flo et al's No. 1 Shoemaker, SE SW SW Sec. 27-7-26w.. Shut down 2,445 ft.

STAFFORD COUNTY

Rosenthal, Stanolind and Amerada's No. 1 Gray, C NE Sec. 11-24-13w ..... Shut down 2,900 ft.

STEVENS COUNTY

Argus Prod.'s No. 2 Christopher, C NE Sec. 10-33-39w .. Shut down 5,521 ft.

SUMNER COUNTY

Trees Oil Co. and Shell's No. 1 Springate, NE SE SW Sec. 6-34-2 ..... Location.
Spencer et al's No. 1 Porter, NE SW Sec. 12-33-4w .... Drlg. 1,655 ft.
Otstot et al's No. 2 Marlow, C SE NW SE Sec. 22-33-3w.. Drlg. 3,505 ft.

WASHINGTON COUNTY

Sincox et al's No. 1 Penwell, NW SE NE Sec. 16-3-3 .... Shut down 1,720 ft.

FREE 30 Days' TRIAL !

New TAG Steam Trap —with Unique Differential Setting Feature

NEVER before in the history of Thermostatic Steam Trap manufacture has industry been offered a trap with the outstanding element of the TAG Differential Setting Feature which makes it possible to discharge condensate at a temperature corresponding to a uniform differential pressure from 0 to 20 lbs. below the operating steam pressure . . . a sure guarantee of actual saving of steam dollars.

TAG, with characteristic thoroughness, has included other outstanding economies, among which are reversible as well as renewable Monel seats and discs, assuring double life to both these wearing parts.

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Please send us ☐ Traps, No. 50, for free trial. After 30 days we will either return them or accept your invoice at $12 each, Net, F.O.B. Factory.

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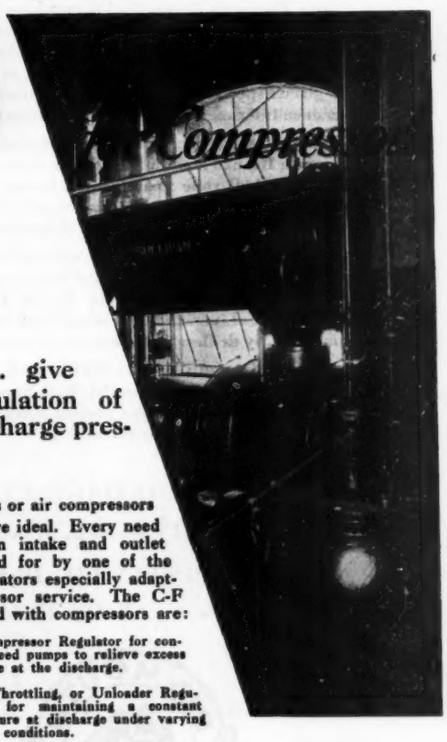

. . give dependable regulation of suction and discharge pressures.

FOR gas or air compressors C-F Regulators are ideal. Every need for regulation on intake and outlet lines is provided for by one of the three C-F regulators especially adapted to compressor service. The C-F regulators used with compressors are:

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(3) C-F Vacuum Regulator (two types) for safeguarding against dangerous vacuums.

Write for descriptive literature.

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Plymouth Manila Bull Ropes have been used for many years throughout the oil industry. They are recognized as the finest quality money can buy.

Now, Plymouth Manila Bull Ropes have been advanced to a still higher point of quality—an unquestioned position of quality leadership—by a special additional process of manufacture. *And at no additional cost to you.* They are now given a special Bronzo lubricant treatment which tends to reduce internal friction and adds life to the rope.

Many field service tests have definitely proved that Plymouth Bronzo Manila Bull Ropes represent a decided advance in bull rope manufacture. In one such test, for example, three Plymouth Bronzo Manila Bull Ropes far outlasted five other ropes. That is almost two to one!

Durability and resistance to external wear are outstanding features of Plymouth Oil Well Cordage. Besides bull ropes, there are Plymouth Manila Drilling Lines, Crackers, Cat Lines and Spinning Lines—all highly recommended by drillers and contractors everywhere.

Ask for Plymouth Bronzo Manila Bull Rope at your nearest branch store of the Oil Well Supply Company. There, also, a folder on the proper method of splicing bull rope will be yours for the asking.

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North Plymouth, Mass.

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PLYMOUTH—"*the rope you can trust*"

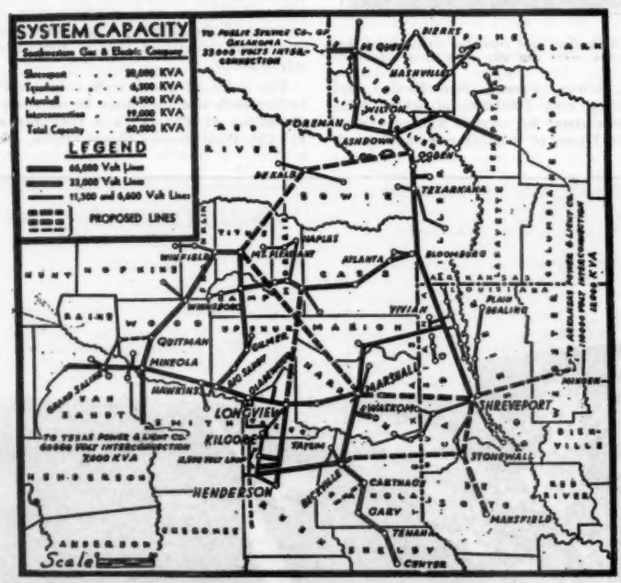
USE OF ELECTRIC POWER IN EAST TEXAS IS SHOWING LARGE INCREASE

By R. M. Winsborough
Southwestern Gas & Electric Co., Shreveport, La.

Electric power is being used widely in the East Texas oil field. Nineteen thousand horsepower have been contracted for by the Southwestern Gas & Electric Co. in the oil area since January 1. Most of this is used for pipe line pumping, with gathering line pumps also requiring a large portion of the total. Electric power for drilling has been used by a few operators. Well pumping has not yet developed into a large demand for power, although this may take place at a later date.

This electrical load is divided approximately into 9,500 horsepower for main pipe line pumping stations, 7,500 horsepower for gathering line pump stations, 1,500 horsepower for electric drilling and 500 horsepower for refinery use.

The unusual demand for power has made necessary an extensive construction program by the power company serving the area. This company is the Southwestern Gas & Electric Co., with general offices in Shreveport, La., and local offices in Longview, Kilgore, Henderson, Marshall and Gladewater.



The company has for some years operated a comprehensive and adequate network of 66,000-volt transmission lines throughout the oil area. Since discovery of oil the system has been extended, voltages raised, and new lines and substations erected to handle the oil field load.

Following discovery last fall by C. M. Joiner, the power company built an extension from Henderson into Joinerville to supply the new townsite and the new well. Kilgore, at that time, received service from an 11,500-volt line from Longview. With discovery of oil at Kilgore, the company completed a loop of 11,500-volt line through Joinerville, Kilgore, Henderson and Longview, feeding it from the Longview-Henderson 66,000-volt line. Substations were constructed at Kilgore, Longview, Henderson, Joinerville and Friars Switch to handle the distribution.

While these extensions were being built into the western edge of the pool, the 66,000-volt line from Marshall to Beckville was extended to Joinerville, completing a 66,000-volt loop around the field, with substations at Marshall, Longview, Joinerville and Beckville. A radial feeder from this loop ties into the Henderson substation and provides two-way feed on the Henderson-Joinerville line.

The 66,000-volt loop is fed from both sides. To the east, the 66,000-volt circuit is fed from the 30,000-kilowatt generating station of the company in Shreveport. To the west, the 66,000-volt line from Longview is fed from an interconnection with the Texas Power & Light Co. at Mineola and Grand Saline, providing for interchange of power.

Following the development around Gladewater, the company built a 3,000 KVA substation there and completed an 11,500-volt line southward through Kilgore, completing an 11,500-volt loop through Gladewater, Kilgore, Turnertown, Joinerville, Henderson and Longview.

To the north of the present area, the company operates a well-integrated system of 66,000-volt lines. The company operates a 66,000-volt line from Shreveport north to DeQueen, Ark. A branch from this line runs through Atlanta to Hughes Springs and on to Daingerfield, operating at this time at 33,000 volts but insulated for 66,000-volt operation. This line feeds on at 33,000 volts through Mount Pleasant, Pittsburg, Gilmer and Big Sandy, tying-in at Big Sandy with the 66,000-volt Grand Saline-to-Shreveport trunk line.

At present in addition to continual distribution system construction in East Texas, the company is preparing for the immediate construction of a 66,000-volt line from Shreveport to Marshall to provide a third direct feed from the Arsenal Hill station at Shreveport to the oil area. Right of way for this line is being obtained and material is being assembled for the construction.

Adequate power supply for the entire system and for future requirements is amply guaranteed. The Southwestern Gas & Electric Co. has ample generating capacity in its plants at Shreveport, Marshall and Texarkana. Interconnections with other power companies provide for an additional reserve of power.

EUROPEAN BENZOL CONFERENCE

The fourth plenary meeting of the International Conference of Benzol Producers took place June 12 at Hamburg, Germany, at which were present delegates from Great Britain and the Continent. The delegates from Great Britain consisted of Sir David Milne-Watson, LL.D., D.L., President of the National Benzol Association, and some directors of National Benzole Co., Ltd. Producers of benzol have made an arrangement to standardize methods of test for all grades of benzol in order to establish uniformity of quality of motor and industrial benzol by the European benzol producers.

OIL MEN GUESTS AT DEMONSTRATION OF EQUIPMENT FOR FIGHTING FIRES

NEW YORK, July 7.—Improved methods and equipment for fighting oil fires were featured in a recent demonstration of fire protection devices at the Pyrene Manufacturing Co.'s test field in Newark, N. J. The demonstration was attended by about 250 persons, including fire chiefs of New Jersey towns where refineries, bulk terminals, etc., are located, and fire prevention and safety supervisors from oil companies, public utilities, railroads, etc.

The demonstration was divided into three groups. Group A featured tests showing the combined wetting and cooling effect of Pyrene liquid and air dilution and the smothering effect of Pyrene vapor on a wide variety of flammables. The standard 1-quart extinguisher was used to extinguish fires in a pail of gasoline, tub of lacquer, tub of alcohol, spilled gasoline on the ground, oil-soaked cotton waste, and calcium carbide.

The new 1-gallon air pressure type Pyrene extinguisher was shown in extinguishing fires set in a row of six wash tubs, the six fires being extinguished in 12 seconds on the first demonstration, and 13 seconds on the second. The 1-gallon air-pressure type was also used in extinguishing flames formed by igniting a long train of gasoline spilled on the ground. The new 1-gallon air-pressure type extinguisher is charged with Pyrene liquid and compressed air for its expulsion, and has an unusually long range of stream throughout the entire discharge. As little of the liquid may be used as needed and the rest retained in the extinguisher indefinitely. The liquid level in this type extinguisher is visible through a sight glass, and the air pressure is under observation on a pressure gauge.

Electrical Equipment Unharmed

Other features of the Group A demonstration included putting out a fire set in the motor of a truck, with the gasoline line from the gravity tank purposely broken; conquering flames in a gasoline-soaked electrical switchboard; extinguishing a similar fire in an operating motor on a regular chain-making machine in the company's plant, adjoining the test field, and a special extinguisher system for motor boats, all of which stressed the fact that Pyrene is a nonconductor of electricity and is harmless to electrical equipment.

The Group B demonstration illustrated the efficiency of the Pyrene 2½ and 5-gallon Duragarde wet chemical and water types of fire-fighting equipment, showing the standard method of use of this type of equipment for the most common types of fire, such as bonfires, etc. The 2½-gallon Phomene extinguisher and the 1-gallon Pyrene were also shown.

The Group C demonstration held the greatest interest for the oil men present. The first feature showed the 2½-gallon Phomene tanks used to blanket oil and paint hazards by cutting off the air over tubs of gasoline and a tub of pyroxylin lacquer ignited for the demonstration. The Phomene made a definite lasting blanket over the oil surface and effectively prevented re-ignition.

The next feature in this group was the ignition of oil and gasoline covering 50 square feet of ground. This was smothered quickly by a 10-gallon Phomene installation.

Fuel Oil Primed With Gasoline

The next demonstration was the firing of 95 square feet of fuel oil, primed with gasoline. This was extinguished by the flow from a 40-gallon Phomene tank in 47 seconds, the demonstration stressing the ability of Phomene to fill in the square corners of tanks.

A demonstration of unusual interest to oil plant men was a "mixed hazard with flowing oil," designed to simulate a gasoline loading rack, a warehouse handling flammable liquids, a pier front, etc. This fire was attacked with a Foam Brush station employing Model 401 Phomene Accumulator, and was extinguished speedily.

The most spectacular feature of the afternoon was the firing of an oil tank of 500 square feet surface area. The tank was filled with fuel oil, primed with gasoline, and the flames were extinguished with a fixed Phomene system using Model 2802 Phomene Accumulator. Because the demonstration was held outdoors, the operation of the system was manual, although the equipment is designed for automatic operation in most instances. Before this test, a 200-square-foot gasoline surface directly exposed to the main fire was covered with Phomene foam, which effectively blanketed this second tank and prevented the spread of the fire. Other typical risks involving the extinguishing of oil fires were included in the Group C phase of the demonstration.

C. F. Durfee, systems engineer and chairman of the company's demonstration committee, was in active charge. Among the oil men attending were: P. Seitz, superintendent of construction, Warner-Quinlan Co.; L. C. Woodbridge, safety supervisor, New York City division Standard Oil Co. of New York, and M. J. Miller and O. L. Elgar, also of the New York company; J. R. Alexander, superintendent of the Continental Oil Co.'s New Jersey marine terminal; A. A. Lawson, fire chief at the Standard Oil Co. of New Jersey Bayway refinery, and R. A. Dickson, mechanical engineer of the Bayway plant.

METHOD OF LOCATING SALT WATER IN WELLS

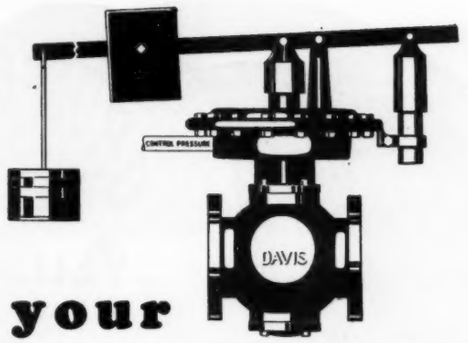
(Continued from Page 18)

throughout the portion of the well that is being studied. Readings may be taken both on the down trip and the up trip as a check against each other. As the resistance of the cable remains practically constant, the only variable part of circuit within the well is the fluid existing between the electrodes. The reading of the amount of resistance required to balance this change through the bridge is a direct measure of the resistance of the fluid between the electrodes within the well. A schematic diagram is shown herewith.

The first run is used as a basis with which to compare subsequent runs. By such a comparison, entrance of foreign fluid from the formation is accurately located, as well as its movement within the well. Between runs the well may simply be standing idle, or it may be bailed from the top to change the head on the sand and allow water to enter from lower head sands or to increase the water entry to give a measure of the volume entering or to determine the relative importance of different sources. Bailing from bottom and adding fluid at the top to replace that bailed off is used to remove salt water or sand, actually amounting to a reconditioning of the hole. The method may be used on wells flowing large volumes of oil and gas as well as on depleted wells.

Conditioning the Well

Several methods are used to condition the well. The column of fluid produced in the well may be either fresh water, mud, or salt water of a higher salt content than that produced by the well. Conditioning is accomplished by circulating with the desired fluid, running in the fluid outside the tubing while pumping off bottom, spotting the fluid with a bailer, running the fluid outside the tubing while swabbing, or by bailing off bottom while adding the conditioning fluid at the top. Another method is to salt the well thoroughly by distributing a concentrated brine along the depth to be studied. A bailer is used fitted with a bean to restrict the discharge of brine. A special valve provides positive opening when bottom is reached but not before, and then as it is drawn at uniform speed to the top, brine flows at a uniform rate through the bean. This is repeated until the desired salinity is obtained. This method is of particular value when the entering water, as de-



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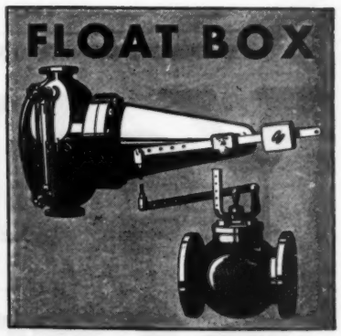

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termined by sample, is very low in salt content.

A sketch illustrates the process of conditioning and typical results. At the left (1) is shown the probable state of the well fluid as indicated by Run No. 1 just after it has been conditioned with fresh water or mud. An intermediate high head salt water appears to be entering the well between two sands producing clean oil, both of which are above a previously placed plug. Run No. 1 is made and shows points at A, B, and C, where there is a decrease in the resistance of the well fluid. These points may or may not indicate entering water. Point B shows sufficient decrease to indicate the probability of an entering water.

Prior to making Run No. 2, a quantity of fluid is bailed off the top to reduce the head on the sands. Run No. 2 shows no change of consequence in peak A except that it has moved upward due to water entering from below. The sudden decrease in the resistance at B' and C', however, indicates a positive change in resistance of the well fluid at these depths, indicating that water is entering the well just above the plug as well as through an intermediate sand. The widening out of the curve peak at B' indicates that the major portion of the water is coming through the intermediate sand. Similarly the narrowness of the peak at C', as well as the fact that it was hardly noticeable prior to bailing fluid from the top, shows that this water source is of relatively small volume.

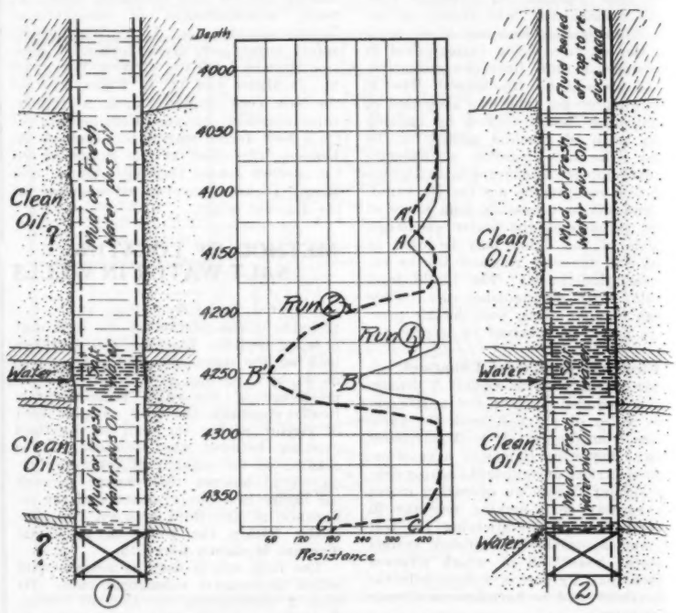
In some cases of this type, it has been found feasible to seal off this intermediate water, and produce only from the water-free sands above and below. This is done by perforating the casing above and below the point of water entrance. A quantity of cement is placed by dump bailer upon a bridge set below the water. A production test is made above this plug and if it shows the water excluded, the plug is drilled through to produce the water-free sand below as well. In cases where the water head is not too great, production from both sands has been possible in a large number of such cases.

California Example

A condition quite often exists in California fields where a considerable quantity of water was being pumped along with the oil. Its exact point of entrance was unknown. The problem was to find this point in order to determine whether it was feasible to exclude it. The well was washed with fresh water, circulating through tubing extending to bottom. The "water-witch" was then run in, and the resistances obtained at the various points. An extremely salty section of the well fluid is shown by the greatly decreased resistance around 5,620 feet. Such a sudden decrease in resistance even on the initial run was a fairly definite indication of the entrance of salt water at this point.

As a check however (at least two runs are always made) 170 feet were bailed from the top of the fluid column, thus lowering the head in the well and allowing more formation water to enter. A second run of the instrument, showed a very well defined resistance peak at 5,625 feet, indicating this definitely as the point of water entrance. The rise in resistance is due to the movement of the salt water upward to take the place of that bailed off the top.

In another well an analysis of the well fluids showed the water to be fresh. The point of entrance might have been most anywhere in the well. The operator suspected leakage around the plug. This well was conditioned by salting the fluid column with the bailer previously described. The curve recorded shows a sudden increase in well fluid resistance at 1,499 feet. Other sudden increases were noted around 1,700 feet and 2,000 feet. Thirty cubic feet of fluid were bailed off the top. This reduced the pressure head in the well allowing more fluid to enter. The second run of the instrument showed a marked change at the 1,499-foot point only, the other irregularities in the two curves being merely due to variations in the distribution of the salt in the original conditioning. The large increase in resistance at 1,499 feet shows however that additional fresh water had entered here. The curves show plainly that the water is entering through a casing leak and that this is the only point water was entering the well.



Sketch illustrating the process of conditioning and typical results of using the electrical instrument for determining position of water in well.

Test Run

Data was also secured on a pumping well conditioned by introducing fresh water through the casing while continuing to pump through the tubing. The well was let stand for some time and a test run made. A pronounced decrease in resistance just off bottom seemed to indicate leakage around the plug. Check runs each made after a short period of standing idle show the continued entrance of a high head water around the plug and its gradual rise in the well to the 2,440-foot level where it is entering the lower head sands above the plug.

In one case a high head top water entered close to the top of the perforations and travelled downward into the oil zone. Survey was made after washing with fresh water in sufficient quantities to replace most of the salt water originally in the hole, and so distribute the small amount remaining or entering during the washing period, that it would not affect the results. This run showed

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a sudden decrease in resistance of the fluid just below the top of the perforations which gradually increased downward, indicating a probable entrance of salt water at 6,180 feet and its movement downward. Prior to the second run, 500 lineal feet of fluid were swabbed from the top. This run proved the place of entrance of water and that the water was flowing downward and through the oil zone. Such a condition would obviously if it continued, not only damage the well tested, but adjacent wells as well, and possibly a large proportion of the field.

In another interesting case only the upper part of the well was conditioned with fresh water. Curves show a very close correspondence from the bottom up to 4,318 feet, showing that there is no entering water below this point. As there is a period of 2½ hours between these two runs, even a small quantity of water entering below would have been indicated. At 4,245 feet there is very definite entrance of salt water. Between Runs 1 and 2 100 feet of fluid was bailed from top.

Totally Unsuspected

A very interesting condition, totally unsuspected by the operator, but discovered with this instrument, was found in a pumping well. This well was conditioned on the beam by introducing fresh water, while continuing to pump. Initial run showed a very irregular curve, a definite break at 4,050 feet, another at 4,150 feet and a less pronounced

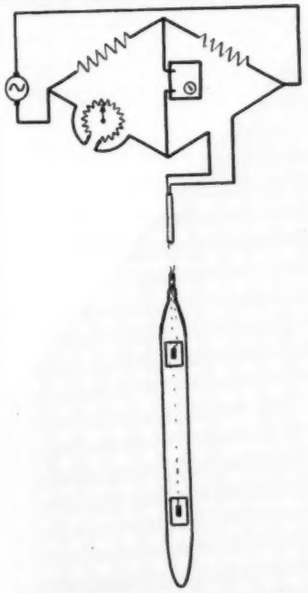


Diagram showing circuit of electric current from surface through instrument in well and back to surface in "water witch."

break between 4,425 feet and 4,475 feet. Twelve minutes after the first run was made, the instrument was run for the second time, merely allowing the well to stand idle during the intervening period. At this time a further decrease was indicated at 4,500 feet also at 4,150 feet and the bottom break was definitely shown at 4,460 feet. Between 4,150 feet and 4,460 feet the resistance was practically constant, and at a low value, approximately 70 ohms. Twenty minutes later a third run was made which showed additional salt water had entered at 4,050 feet as well as between 4,150 feet and 4,160 feet. From there on down the resistance again remained practically constant. Before taking the fourth run, 47 cubic feet of fluid were bailed from the top. This run showed that additional fluid had entered the well below 4,050 feet, the change in the curve above this point being due to the flow of fluid upward to replace the head bailed off. In this last run the total variation in resistance of the fluid below 4,050 feet is only about 5 ohms. All of the curves have a uniform break at 4,465 feet, coming together to the same resistance value at this point.

Summarizing the results entering salt water is definitely located between 4,042 feet and 4,050 feet. Additional water enters between 4,153 feet and 4,160 feet. This entering salt water is flowing downward through the well and out into a lower head sand at 4,465 feet. Accurate correlation of the results of other tests in this same field show that a well defined water sand is to be expected around 4,465 feet.

Information obtainable from such surveys as these is definite enough to enable the operator to proceed with repair work, with the assurance that the repair will effect the results desired when successfully made. If repair is not possible or is not likely to succeed, such a state of affairs will be apparent. Many repair jobs are undertaken only to fail of their purpose and in many cases make it all the more difficult to effect the repair actually necessary to exclude the water. Sometimes the well is completely ruined for further production by misdirected repairs, accounting for the hesitancy of many operators to undertake any repair work on wells that are producing oil in paying quantities, regardless of the amount of water brought to the surface. It is significant that the larger operators, as well as many of the smaller producers, in California have adopted this method before proceeding with any repair work whatsoever, even where there is a fair degree of certainty as to water conditions through previous tests on nearby wells. Edgewater encroachment at a new level, casing leaks, plug leaks, or other water entrance points not previously discovered may be present and the water may not be entering where expected at all.

The accuracy of the method might be emphasized by a case where opportunity for a very close check was given. Water was suspected as entering around a defective bottom plug. A test with this instrument definitely indicated a leak through the casing at 2,190 feet. The casing was cut off at 2,200 feet and pulled. At the surface, measurement showed the casing defective at 2,188 feet. Numerous other surveys with this instrument have checked out just as closely by the successful completion of indicated repairs.

TRIBUTE TO MR. McGRAW BY KANSAS OPERATORS

The following resolution of sympathy from the operators in the Ritz-Canton area of McPherson County, Kansas, was drafted by a committee composed of F. O. Prior, president of Stanolind Oil & Gas Co.; E. R. Filley, manager The Texas Company, and R. B. Roark, production superintendent Shell Petroleum Corp.:

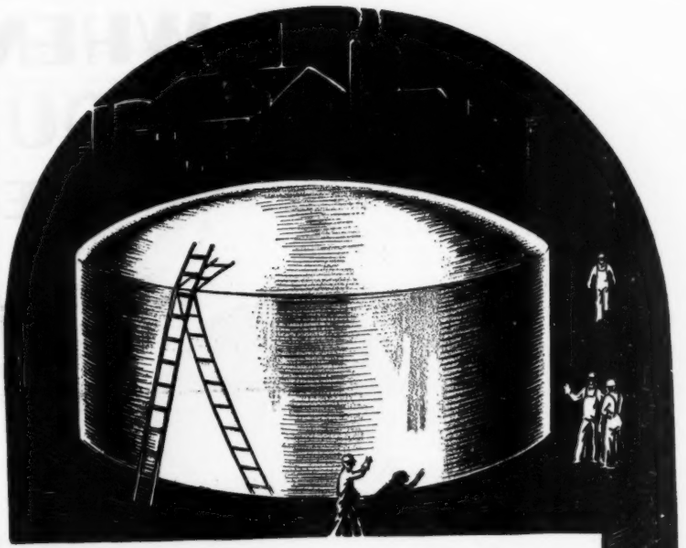
"Whereas, the oil and gas operators and producers of the Ritz-Canton area, McPherson County, Kansas, assembled in a general meeting at Wichita, Kans., on Wednesday, the 24th day of June, 1931, have learned of the recent death of Henry McGraw, vice president and general manager of the Gypsy Oil Co. and Gulf Pipe Line Co., at Baltimore, Md., on June 19, 1931;

"And whereas, Mr. McGraw was a staunch friend of the oil producers of the entire Mid-Continent district during his long association with the Gypsy Oil Co. and the Gulf Pipe Line Co., both in the legal department and as an executive of said companies;

"And whereas, the uniform courtesy and consideration evidenced by Mr. McGraw in his association and dealing with the operators and producers of McPherson County have been heartily appreciated;

"And whereas, in the death of Mr. McGraw the oil industry as a whole and the operators in the Mid-Continent area, and particularly the operators of McPherson County, Kansas, have lost a loyal friend and a wise adviser;

"Now, therefore, be it resolved by the unanimous action of the oil and gas operators and producers of the Ritz-Canton area that we sincerely regret and deplore the untimely passing of our friend, associate and advisor, Henry McGraw."



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LOUISIANA-ARKANSAS PROVEN AREAS

(Continued from Page 41)

Jordan Drlg. Co.'s No. 1 McCormick, Sec. 2-7-11 ..... Completed June 29, flowing 500 bbls.; 2,412 ft.
Zeke Lohman's No. 1 McCormick, 660 ft. E, 330 ft. N, SW cor. NE SW, Sec. 2-7-11 ..... Drlg. 840 ft.
Loring Oil Co.'s No. 16 Bowman-Hicks, 640 ft. W, 300 ft. S, C, Sec. 3-7-12 ..... Began June 29; set 10-in. 87 ft.
Loring Oil Co.'s No. 17 Bowman-Hicks, 1,600 ft. S, 275 ft. W, NE cor., Sec. 16-7-12 ..... Derrick.
Lyons & Neely's No. 1 Duggan, NW SE, Sec. 14-7-11 ... Location.
Magnolia Pet. Co.'s No. 1 Peterson, 300 ft. S and E, NW cor. NE NE, Sec. 10-7-11 ..... Rigging up.
L. K. McGuffin's No. 1 Bush, NW cor. NW SE, Sec. 1-7-11 ..... S.D. 400 ft.
Ben Merritt, tr.'s No. 2 Byrd, Sec. 1-7-11 ..... S.D. 88 ft.
Sabine Royalties Co., Inc.'s No. 1 Hill, 400 ft. S, 200 ft. E, NW cor. NE NE, Sec. 5-7-11 ..... Deepened to 2,546 ft; W.O.S.R.
Sabine Royalties Co.'s No. 2 Hill, Sec. 32-8-11 ..... Dry and abd. 2,545 ft.
The Texas Co.'s No. 1 A. L. Landrum, 330 ft. S and W, NE cor. SE, Sec. 32-8-11 ..... Set 6⅝-in. 2,236 ft.
Houston-Sabine Prod. Co.'s No. 1 Sabine Lbr. Co. (was Triangle Pet. Co.'s No. 2 Sabine Lbr. Co.), 330 ft. N and E, SW cor., Sec. 36-9-12 ..... Tested dry; arranging to deepen 2,400 ft.

WEBSTER PARISH

Cassidy & Davis' No. 1 Nickerson, 300 ft. S, 300 ft. W, NE cor. SW, Sec. 29-22-10 ..... Abd. 150 ft.

ARKANSAS

UNION COUNTY—EL DORADO

Lion O. & R. Co.'s No. 9-A G. P. Hayes, 242 ft. S, 246 ft. W, NE cor. Lot 5, NE, Sec. 4-16-15 ..... Cored sandy shale 4,212-14 ft.
Southern Prod. Co.'s No. 1 Wingfield, NE cor. SE NW, Sec. 16-19-15 ..... S.D. 2,608 ft.

UNION COUNTY—URBANA

Marine Oil Co.'s No. 1 Winn est., 330 ft. S and E, NE cor. S½ NW, Sec. 11-18-13 ..... T.A. 3,586 ft.
Marine Oil Co.'s No. 2-E Thompson, 330 ft. N, 330 ft. E, SW cor. NE NE, Sec. 10-18-13 ..... Location.
Wilson & Chapman's No. 1 Adkins, 330 ft. N and W, SE cor. SW NE, Sec. 3-18-13 ..... Arranging to make D.S. test 3,596 ft.

EAST TEXAS

PANOLA COUNTY

Ark.-La. P. L. Co.'s No. 14 Werner, 341 ft. S, 300 ft. W, NE cor. Werner 74-ac. tr., Ben C. Jordon Sur. ..... Drlg. hard lime 4,280 ft.
Daisy O. & G. Co.'s No. 1 Rucks, John Palmer Sur. ..... Drlg. 2,740 ft.
Dillon & Braham's (was W. G. Banks et al's) No. 1 C. O. Baldwin, 1,395 ft. W, 1,362 ft. S, NE cor. Baldwin 290 ac. in Hampton West Sur. ..... S.D. 1,555 ft.
United Prod. Corp.'s No. 17 Steele, 1,320 ft. N, 660 ft. W, SE cor. C. D. Steele lse., in B. C. Jordan Sur. .... Location.
United Prod. Corp.'s No. 10 Warner, 358 ft. N, 2,467 ft. W, SW cor. Thos. Cox Sur. in Ben Jordon Sur. .... Set 6⅝-in. 4,638 ft; W.O.C.
Southwestern O. & G. Co.'s No. 1 E. R. Vinson, 3,005 ft. S, 1,001 ft. W, NE cor. C. T. Anderson Sur. ..... S.D. 2,650 ft.

MISSISSIPPI

HINDS COUNTY

Hopkins Gas Co.'s No. 1 Ridgeway, 680 ft. N, 70 ft. W, SE cor. NW, C, Sec. 2-5-1e ..... Began June 27; set 10-in. 192 ft; drlg. 842 ft.
Love Pet. Co.'s No. 3 Maley, 2,780 ft. E, 960 ft. S, NW cor., Sec. 15-5n-1e ..... Rigging up.

WILDCAT OPERATIONS IN LOUISIANA-ARKANSAS

(Continued from Page 41)

RED RIVER PARISH

La. Oil Dev. Co.'s No. 2 La. Delta Pecan Co., 2,950 ft. S, 300 ft. E, NW cor., Sec. 27-13-11 ..... Spudded in; S.D. 50 ft.
Mack Jourden Co.'s No. 1 Lockett, 4,035 ft. S, 1,080 ft. E, NW cor. SW, Sec. 29, in Sec. 32-13-10 ..... Drlg. 2,000 ft.

RICHLAND PARISH

Alto Gas Co.'s No. 2 Hunt, 660 ft. S and E, NW cor., Sec. 12-17-5 ..... Derrick.
Southern Carbon Co.'s No. 1-B C. M. Noble, 2,966 ft. N, 1,525 ft. W, cor. Secs. 7, 8, 17 and 18, in Sec. 37-15-8 .. Location.

SABINE PARISH

Diffie & Barnett's No. 1 Lites (was J. W. Clark's), 330 ft. N, 330 ft. W, SE cor. SW NW, Sec. 34-8-11 ..... S.D. 105 ft.
R. L. Gay, tr.'s No. 1-A Long Bell Lbr. Co., 430 ft. S, 300 ft. W, NE cor. NW NW, Sec. 10-8-13 ..... Drlg. lime 3,541 ft.
Langbridge Oil Co.'s No. 1 Stephens, 330 ft. N and E, SW cor. SE NE, Sec. 17-9-11 ..... Began June 26; set 10-in. 100 ft; drlg. 250 ft.
J. J. Keen, tr.'s No. 1 Belton (no check), Sec. 31-9-13 ... Set 8-in. 1,590 ft.
H. W. Perritt's No. 4 Bowman-Hicks, SE cor. SE NE, Sec. 2-7-12 ..... Arranging to test 2,320 ft.
A. H. Thames' No. 1 Edward est., 150 ft. NW SE cor. NE SE, Sec. 8-8-13 ..... S.D. for water 1,200 ft.

TENSAS PARISH

Nick Barbare's No. 1 Mutual Realty Co., 660 ft. S and W, NE cor., Sec. 36-11-9e ..... Abd. 876 ft.
A. R. Willis et al's No. 1 Currey, 1,320 ft. S, 1,320 ft. E, NW cor., Sec. 39-11-12 ..... S.D. 3,545 ft.

UNION PARISH

Bahan & Bahan's No. 1 U. J. Jarmon, 720 ft. E, 3,329 ft. S, NW cor. NE, Sec. 27-22-3 ..... Completed June 25; 1,023,000 ft. gas 2,185 ft.
Dan Brooks' No. 1 Odus Douglas, 330 ft. S and E, NW cor. NE SW, Sec. 9-22-2 ..... Location.
T. P. Fields, tr.'s No. 1 Summitt Land Co., C W½ NW, Sec. 1-21-1w ..... Rigging up.

WEBSTER PARISH

Coyle, tr.'s No. 1 Fraser, 200 ft. N, 200 ft. E, SW cor. NE SE, Sec. 27-23-11 ..... Location abd.

WEST CARROLL PARISH

United Gas Public Service Co.'s No. 1 Pioneer Cooperage, 663 ft. E, 3,954 ft. S, NW cor., Sec. 29-21-9 .... Drlg. 3,066 ft.

WINN PARISH

Gulf Ref. Co.'s No. 1-A Bodcaw Lbr. Co., 911 ft. N, 970 ft. E, SW cor., Sec. 4-10-5w ..... Drlg. 1,960 ft.

ARKANSAS

CHICOT COUNTY

R. R. Smith's No. 1 Lytle, 660 ft. N, 660 ft. E, C, Sec. 21-23-3 ..... T.A. 2,925 ft.

COLUMBIA COUNTY

Kendall Oil Co.'s No. 1 Fullenwelder, Rhea & Kitchen, Sec. 13-17-22 ..... S.D. 778 ft.

CLAY COUNTY

S. C. Jeffus' No. 1 Underwood, 510 ft. N, 350 ft. W, C NW SE, Sec. 4-20-3 ..... Repairing derrick 1,352 ft.

CLEVELAND COUNTY

Crum & Stillwell's No. 1 E. R. Bell, Sec. 10-10s-12w ..... Rigging up.

CLEBURNE COUNTY

(Cable tools)

Donnelly-Craver et al's No. 1 Donophan Lbr. Co., SE cor. NW, Sec. 33-11-9 ..... S.D. 3,740 ft.

DALLAS COUNTY

E. C. Brewer's No. 1 W. E. Hillman, 330 ft. E, 40 ft. S, NW cor. SE NE, Sec. 20-10-13 ..... S.D; W.O. 2,869 ft.
J. H. James, tr.'s No. 1 Fordyce Lbr. Co., 300 ft. S, 300 ft. E, NW cor. NW NE, Sec. 11-9-15 ..... S.D. funds 2,520 ft.

HOT SPRINGS COUNTY

Star Oil Co.'s No. 1 Cunningham, 285 ft. S, 285 ft. W, NE cor., Sec. 11-5-16 ..... Drlg. 1,300 ft.

LAFAYETTE COUNTY

Smitherman & McDonald's No. 1 Rogers, 330 ft. N and E, SW cor. NW SE, Sec. 17-15-22 ..... Dry and abd. 2,035 ft.

LINCOLN COUNTY

Lawrence Cook, tr.'s No. 1 McGhee Planting Co., 420 ft. S, 320 ft. W, NE cor. NE SW, Sec. 5-8-7 ..... Drlg. 2,110 ft.

LITTLE RIVER COUNTY

Roberts Oil Co.'s No. 1 H. J. Russell, 330 ft. E, 330 ft. S, NW cor., Sec. 25-12-29 ..... Location.

LOGAN COUNTY

J. H. Flowers' No. 1 J. H. White, Sec. 13-6-26 ..... S.D; W.O. 3,570 ft.

MILLER COUNTY

East Texas O. & G. Co.'s No. 1 Harvey, 500 ft. E, 300 ft. S, NW cor., Sec. 2-15-26 ..... Abd. 910 ft.
E. & F. Oil Co.'s No. 1 E. L. Beck, 200 ft. S, 200 ft. E, NW cor. SW, Sec. 36-15-26 ..... Abd. 2,968 ft.
Fitzwater et al's No. 1 Beck, 200 ft. N, 200 ft. W, SE cor. SW SE, Sec. 33-15-26 ..... Abd. 98 ft.
J. D. McRae's No. 1 Smith, 150 ft. N, 150 ft. W, SE cor., Sec. 25-15-26 ..... Abd. location.
W. E. Noel et al's No. 1 Dickson hrs., 1,980 ft. W, 660 ft. S, NE cor., Sec. 11-20-27 ..... Location.

OUACHITA COUNTY

Copenhaven et al's No. 1 Elliott, Sec. 11-15-17 ..... Bailed dry 3,210 ft; S.D; W.O.
Boling & McLeon's No. 1 L. D. Nealy, 150 ft. S, 150 ft. W, NE cor. SE SW, Sec. 25-16-15 ..... Drlg. chalk 1,803 ft.

PIKE COUNTY

E. R. Henderson's No. 1 Tilyou, 660 ft. W, 500 ft. S, NE cor. NE SE, Sec. 26-8-14 ..... T.A. 2,909 ft.
E. R. Henderson's No. 1 J. L. Lee, 400 ft. S, 350 ft. E, NW cor. SW SE, Sec. 31-8-24 ..... Drlg. 697 ft.

SCOTT COUNTY

Heavener O. & G. Co.'s No. 1 Riser, Sec. 36-4-26 ..... S.D; T.D. 1,436 ft.
Waldron O. & G. Co.'s No. 1 White, NE cor. SW NW, Sec. 17-3n-29 ..... S.D; waiting on csg. 1,860 ft.

UNION COUNTY

Chapman & Wilson's No. 1 A. H. Hadley, 330 ft. N, 330 ft. E, SW cor. NE SW, Sec. 3-18-13 ..... 600 ft. fluid 30% S.W. in hole; T.A. 3,570 ft.

VAN BUREN COUNTY

Glenn Kohle et al's No. 1 Scalan, 200 ft. S, 200 ft. W, NE cor. SE NW, Sec. 5-19-13 ..... Abd. 50 ft.

WASHINGTON COUNTY

(Cable tools)

C. H. Willoughby's No. 1 Jones, Sec. 34-16-30 ..... S.D. for funds 1,795 ft.

YELL COUNTY

(Cable tools)

Tegmeier & Luckett's No. 1 Falcon, Sec. 36-7-21 ..... S.D. 5,710 ft.

EAST TEXAS

BOWIE COUNTY

Devore & Midfield's No. 1 Roy B. Cooper, 200 ft. S, 200 ft. W of NE cor. R. B. Cooper 115-acre tract, Wm. Ward Sur. ..... Arranging core 2,885 ft.
Hindeman & Ball's No. 1 Merritt (was Maud-Redwater Oil Co.'s), 175 ft. N, 175 ft. E, SE cor. G. W. Hardidge 100-acre tract on Floyd Merritt tract in Y. S. McKinney Sur. ..... S.D. 2,520 ft.
Tarkington & Jones' No. 1 W. W. Whybark, 200 ft. S, 200 ft. W of SW cor. J. H. Dyer Sur. ..... Derrick.
Lee Timberlake et al's No. 2 Tidwell, 2,510 ft. N, 655 ft. W, SE cor. T. M. Rice Sur. ..... Arranging to resume drlg. 3,000 ft.

CAMP COUNTY

McDonald Bros.' No. 1 Tillery, 150 ft. E, 450 ft. S, NW cor. 127-ac. tr. in J. H. Murphy Sur. ..... S.D. 3,600 ft.

CASS COUNTY

E. K. Atkinson's No. 1 T. J. Wilson, 1,088 ft. S of N line, 2,376 ft. E of W line of H.R.S., J. R. McFarland Sur. ..... Drlg. 2,245 ft.
R. G. Baker's No. 1 W. R. Caver, on W. R. Caver 75-ac. tr., John Lick Sur. ..... S.D. 2,630 ft.
Davis & Pigg's No. 1 Roy Brian, SW cor. Roy Bryan 88-ac. tr., Albert H. Latimer Sur. ..... S.D. 2,055 ft.
Everts Drlg. Co.'s No. 1 H. W. Whittington, 200 ft. S and W, NE cor. 69-ac. Whittington tr., L. Strong Sur. ..... Drlg. 1,050 ft.
Geo. McKamie's No. 1 R. E. Hall, 150 ft. N, 150 ft. W, SE cor. Hall's 117-ac. tr., H. Buckler Sur. ..... Coring 3,960 ft.
C. E. Murdock's No. 1 First National Bank, Evans Watson Sur. ..... Arranging to resume drlg. 3,990 ft.
John Nelson's No. 1 T. A. Irvin, McNary Harris Sur., 200 ft. S and E of NW cor. ..... Began Oct. 11; set 10-in. 120 ft; drlg. 1,462 ft.
Olds & Smith's No. 1 Atheny, 3,056 ft. W-E line, 856 ft. S-N line, J. C. Byers Sur. ..... S.D. 3,000 ft.
John C. Rogers' No. 1 I. E. Lanier, 573 ft. N, 979 ft. W, SE cor. Lanier 86 ac. in K. E. Welborn Sur. .... S.D. 2,275 ft.
John C. Rogers et al's No. 1 W. Q. Henderson, 3,100 ft. S, 3,100 ft. E, NW cor., Wm. Davis Sur. ..... S.D. 955 ft.

HARRISON COUNTY

Ben Banner's No. 1 J. C. Lowery, in center of J. C. Lowery 8-ac. tr., W. D. Stanfield Sur. ..... S.D. 3,300 ft.
Gholson et al's No. 1 Bivins Farm Co., on J. K. Bivins, Jr.'s 320-ac. tr., Thos. Toby Sur. ..... S.D. 2,362 ft.
O. O. Olford et al's No. 1 R. W. Bolding, 330 ft. E of Lloyd Oil Corp.'s No. 1 E. S. Timmons, 150 ft. from N line to 250 ft. from E line of 105-ac. tr., Findley Sur. ..... Location.
SE cor. J. B. Cullen's 161-ac. tr., 300 ft. N of N line of Mrs. C. L. Brown's 20-ac. tr., W. W. O. Stanfield Sur. ..... S.D. 2,050 ft.
O. H. Parkening's No. 1 T. J. Taylor, C, Blk. 32, W. H. Payne Sur. ..... S.D. 2,530 ft.
Ryan Consolidated Pet. Corp.'s No. 1 Dr. H. H. Key, 1,500 varas N of SE line, 500 varas E of SW line, of E. Carroll Sur. ..... Drlg. 3,415 ft.
Ryan Consolidated Pet. Corp.'s No. 1 J. M. Furh, 1,300 ft. N of NW cor. T. J. Copelin Sur., 1,675 ft. SW at right angles to NW SE line of O'Neal Sur. ..... Derrick.
Thomas & Kinsey's No. 1 J. R. Watson, Thos. Iden Sur... Derrick.

MARION COUNTY

Gist, Claunch & Dodson's No. 1 Miller, 1,470 ft. E line, 725 ft. N line, SW cor. H. Fulgran H.R. Sur. ..... S.D. 300 ft.
Geo. Hindeman et al's No. 1 F. V. Lindsey, 2,500 ft. S, most northerly N line, 3,555 ft. E most easterly W line, Alexander Albright Sur. ..... S.D. 2,380 ft.
Hindeman & Rhondo's No. 1 McGaughey, 1,547 ft. W most northerly SW cor., 1,638 ft. N most northerly S line, W. J. Willis Sur. ..... S.D. 3,910 ft.
Shelton et al's No. 1 J. M. McNeal, 300 ft. S, 400 ft. W, NE cor. McNeal's 721-ac. tr., R. Fowler Sur. .... S.D. for fuel 3,750 ft.

PANOLA COUNTY

Hoffer et al's No. 1 Cameron Lbr. Co., center 1,306-ac. tr. in W. M. A. LaGrove Sur. ..... Derrick.
Moses & Wallace's No. 1 Daniel, 600 ft. N and W lines, Mrs. Gerrell 100-ac. tr., SW cor. Isabel Hanks Sur... Derrick.
G. A. Davidson's No. 1 Latham, Wm. Rich Sur. ..... S.D; changing to heavy rig 550 ft.
J. L. Nelson et al's No. 1 J. W. Williams, 300 ft. S, 700 ft. W, NE cor. Williams' 67-ac. tr. in Jas. Hanks Sur. ..... Rigging up.

RED RIVER COUNTY

D. M. Buffington's No. 1 Hossler, E. Hughhart Sur. .... S.D. 2,795 ft.
Johnson Pet. Co.'s No. 2 Randolph, Edw. Dean Sur. .... S.D. 2,280 ft.

SHELBY COUNTY

L. M. Bradley's No. 1 Ashberry (no check), G. W. Mitchell Sur. ..... Drlg. 3,220 ft.
W. L. Chapman's No. 1 Pickering Lbr. Co., C. E. Henry (headright) ..... Estimated 20,000,000 ft. gas blowing wild 3,864 ft.
Chapperell Oil Co.'s No. 2 Holt, Matthew Moore Sur. .... Coring 3,127 ft.
K. H. Francis' No. 1 John Mims, Mary Smith Sur. ..... Moving in rig.

H. P. Glidden's No. 1 Pickering Lbr. Co., Jonas Harrison Sur., 300 ft. E of NW cor., 150 ft. S of N line at right angles Pickering 59-acre tract ..... Drlg. shale and boulders 1,950 ft.
H. H. Gracey's No. 1 J. A. Morrison, 1,500 ft. N, 200 ft. E, SW cor. J. A. Morris' 109-ac. tr., Wm. English Sur. ..... S.D. 2,600 ft; drlg. wtr. well.
Wm. A. Stephens' No. 1 Foster & Billingsly, 150 ft. W of CEL Foster & Billingsly's 109-ac. tr., J. Bowlin Sur... S.D. 1,540 ft.
T. A. Martin's No. 1 J. B. Bush, S 8° E, 2,000 ft. from NW cor. J. B. Bush's 77-ac. tr., thence E at right angles to said line 200 ft., Alfred Lindsey Sur..... Derrick.
Henry Mauilding's No. 1 Frost Lbr. Co., NE cor. Frost Lbr. Co.'s 80-ac. tr., A. D. Fountain Sur. ..... Changing rig 1,880 ft.
George N. Pace's No. 1 E. H. Powers, western J. Timms Sur., 150 ft. E of W line, 200 ft. N of S line Powers 126-acre tract ..... Derrick.
Ridgeway et al's No. 1 Polley, Domingo Gonzales Sur., 2,180 ft. E of SW cor., 160 ft. N at right angles of Polley 457-acre tract ..... Derrick.
Schultz et al's No. 1 Hughes, 150 ft. SW cor. Hughes' 110-ac. tr., J. Clay Sur. ..... S.D. 2,640 ft.
Sloan Prospecting Co.'s No. 1 Sanford, approximately 300 ft. N and 200 ft. E, SW cor. B. Sanford 49-ac. tr. in M. M. Vann Sur. ..... Drlg. shale 2,140 ft.
Sloan Prospecting Co.'s No. 1 Windham, H. English hrs ..... Junked and abd. 3,399 ft.
C. H. Tautenhahn's No. 1 J. C. Bogard, 300 ft. S, 900 ft. E, NW cor. J. C. Bogard's 52-ac. tr., Thomas Baker Sur. ..... S.D. 20 ft; waiting on D.S.
Tenant et al's No. 1 J. Henry, C. Z. Walker Sur..... Rigging up.

WILDCAT OPERATIONS IN MISSISSIPPI

CLAY COUNTY
(Cable tools)

Company, farm and location— Remarks:
Ohio Oil Co.'s No. 1 Cantrell, NE cor., Sec. 16-15-5..... Repairing rig; T.D. 4,308 ft.

HINDS COUNTY
Attkisson & Dyer's No. 1 Downing et al, SE NE, Sec. 27-6-1 ..... Coring chalk 2,545 ft.
Howard Oil Co.'s No. 1 Jackson College, C NW NW, Sec. 9-5-1e ..... S.D. 74 ft.
Southern Pet. Co.'s No. 1 Wilson (was Tri-State O. & G. Co.'s), 320 ft. E, 240 ft. N, SW cor. SE NE, Sec. 28-6-1e ..... S.D. 20 ft; W.O.

JASPER COUNTY
Bay Springs Pet. Co.'s No. 1 Keyes, C NW NE, Sec. 2-12-9 ..... S.D. for wtr. 2,032 ft.

JEFFERSON COUNTY
Stokes & Cleve Love's No. 1 Phillips, Sec. 14-10n-2w.... Moving in rig.

MONROE COUNTY
Amory Dev. Co.'s No. 1 Bourland, Sec. 2-13-19..... S.D. 3,015 ft.
McAlpine et al's No. 1 Cowart, second hole, Sec. 2-12-19.. S.D. 2,950 ft.

NEWTON COUNTY
Bob Talton et al's No. 1 Majure, 400 ft. N, 600 ft. W, SE cor., Sec. 35-16n-11e..... Derrick.

NOXUBEE COUNTY
Thompson & Donohue's No. 1 Donohue, Sec. 25-14n-17e.. Rigging up.

RANKIN COUNTY
Attkisson & Dyer's No. 1 Valentour, 200 ft. S, 200 ft. E, NW cor., Sec. 18-5n-2e ..... Began June 25; set 15½-in. 31 ft.
Harding & Flint's No. 1 Webb, center Lot 32, Blk. B, East Jackson Place, Jackson City Subd., Sec. 12-5-1. S.D. funds 880 ft.
R. A. Moore et al's No. 1 Interior Lbr. Co., Sec. 28-6-1e.. S.D. 900 ft.
Cleve Love's No. 1 Muse, SE cor. SW SW, Sec. 32-7-4e.. S.D. 4,000 ft.
Square Deal O. & G. Co.'s No. 1 Spann, NW cor. SE NE, Sec. 13-5n-1e ..... Derrick.
Union Drlg. Co.'s No. 1 Pate Royalty Co., NW cor. Lot 11, Blk. F, E. Jackson Pl., First Addn., Sec. 12-5n-1e.. Began June 27; set 12½-in. 84 ft; drlg. 172 ft.
United Gas Public Service Co.'s No. 1-A Hartfield, Sec. 7-5n-2e ..... Coring 2,354 ft; Wilcox.
Willis & Culley's No. 1 Applewhite & Holden, 10 ft. N, 60 ft. E, SW cor., Sec. 12-5n-1e..... Derrick.

SCOTT COUNTY
M. U. Culley et al's No. 1 Owens, Sec. 2-8-9..... Derrick.

WARREN COUNTY
Eagle Bend O. & G. Co.'s No. 1 Kiger, SW cor. SW SE, Sec. 9-18-2 ..... Drlg. 2,190 ft.

WEBSTER COUNTY
P. J. McAlpine's No. 1 Henly (was Cumberland Oil Co.'s No. 1 Henly, drilled to 1,960 ft.), SE NW, Sec. 15-21n-11e ..... Drld. to 1,960 ft.

WINSTON COUNTY
Miss. Drlg. Co.'s No. 1 Scarbrough, NW cor., Sec. 15-12-14 ..... Drlg. 3,380 ft.

YALOBUSHA COUNTY
Collett-Carter Oil Co.'s No. 2 Blackmur, 990 ft. W, 285 ft. N, C, Sec. 11-11-4 ..... Drlg. 3,462 ft.

WILDCAT OPERATIONS IN SOUTHWEST TEXAS

(Continued from Page 38)

BEXAR COUNTY
Ingersoll-Mitchell's No. 2 E. B. Carruth, 750 ft. S of No. 1 ..... T. D. 620 ft.; drlg.
Schneider, Rees et al's No. 2 Claussen, 12 miles NE of San Antonio ..... T. D. 850 ft.; drlg.

CALDWELL COUNTY
Mills et al's No. 1 McMahon, 275 ft. SW line, 75 ft. SE line of tract, J. Pinchback Sur. ..... T. D. 2,490 ft.; fishing.
M. O. Rayor's No. 1 Duniap, 150 ft. NW and NE lines of farm, Solomon Seal Sur. ..... T. D. 2,480 ft.; made head of oil; going on pump.
R. R. Ogden's No. 1 O. S. Alexander, 1,300 ft. from N line, 150 ft. from E line of S. Spiller Sur. ..... T. D. 2,353 ft.; abnd.

COMAL COUNTY
Caldwell & Lanier's No. 1 T. J. Byler, 175 varas from W line, 370 varas from N line of 320-ac. tract in the H.E.&W.T. No. 5,894 Sur. ..... T. D. 698 ft.; trying to get csg. on bottom.

DEWITT COUNTY
Gibson & Sturm's No. 1 Clark, Dolores Alderete Sur. .... Rigging up.

DUVAL COUNTY
Coffee et al's No. 1 Jose Garza, center Sur. 49 ..... T. D. 1,430 ft.; drlg.
O'Byrne et al's No. 1 Well, B.S.&F. Sur. No. 568 ..... T. D. 2,632 ft.; testing sand.
S. J. Carpenter et al's No. 1 Juan Benavides, Blk. 33, Mesquite grant ..... T. D. 1,712 ft.; standing.
Southern Crude Oil Pur. Co. and Camp's No. 1 Hubbard, 1,650 ft. from S line, 330 ft. from E line of Sur. No. 75 ..... Rigged up and laying water and gas lines.

FAYETTE COUNTY
Elam & Reynolds' No. 1 Florence, M. Muldoon Sur. No. 13 ..... T. D. 2,610 ft.; flowing fresh water.

GOLIAD COUNTY
V. F. Neuhaus' No. 1 J. E. Pettus, 4,750 ft. N, 28 degrees 20 minutes W of extreme SE cor. of 3,418-ac. tract in Maria de Jesus Ybarbo Sur. ..... T. D. 3,853 ft.; washing down.

GUADALUPE COUNTY
Harry Bruner's No. 2 Jim Sherrill, 330 ft. from NW and SW lines of tract in George Allen League ..... T. D. 180 ft.; changing to rotary rig.
McGarrity et al's No. 1 A. Wesch, Jr., 150 ft. to N and E lines of farm, H. M. Thompson Sur. ..... T. D. 897 ft.; drlg.
Schleyer, Atherton and Armstrong's No. 1 Ogletree, Robert Smith Sur. ..... T. D. 1,745 ft.; drlg.
Linne et al's No. 1 J. E. Linne, center 263-ac. tract in V. Cortario Sur. ..... Moving in rig.
San Antonio Oil & Royalty Co.'s No. 1 Dibrell, 150 ft. from N and W lines of Sec. 6, H.&T.C.R.R. Sur. .... Dropped till work starts.
W. J. Walton's No. 1 Zoboroski, 700 ft. W line of tract, 500 ft. S of Guadalupe River, in Joseph D. Clements Sur. ..... T. D. 2,210 ft.; hole standing 1,000 ft. in oil.

HAYS COUNTY
J. C. Jones et al's No. 1 Byder, John Ingram Sur. .... T. D. 930 ft.; standing.

JIM HOGG COUNTY
Peterman & Minahan's No. 1 Palacios, Sur. No. 231 .... T. D. 1,360 ft.; shut down.
D. C. DeWitt's No. 1 Teofilo Gomez, 1,170 ft. from N line, 150 ft. from W line of Sur. 12 ..... T. D. 200 ft.; shut down.

JIM WELLS COUNTY
Carsil Oil & Gas Co.'s No. 3 McGill, 450 ft. S, 300 ft. E of No. 1 McGill in Wm. D. Baldwin Sur. ..... Ready to spud in.
Gulf Prod. Co.'s No. 1 Schaeffer, 632 ft. W of No. 1 Schaeffer in J. Doyle Sur. ..... Abandoned location.

KENDALL COUNTY
Dixon Oil Co.'s No. 1 Ottmar Behr, 823 ft. from S and N lines of Jessie Wilson Sur., 3 miles S of Sisterdale ..... T. D. 2,630 ft.; reaming.
Sitton et al's No. 1 Garvin, C of NE of D. L. Richardson Sur., in the D. L. Richardson Sur., 1 mile NE from Kendalia ..... T. D. 1,482 ft.; shut down.
Fred S. Dibble's No. 1 Ellebrach, Sur. 77, N part of county ..... Spudded in and shut down.
Hicks et al's No. 1 Speck & Wiedner, Thomas Sur. No. 27, 2 miles S of Twin Sisters ..... Location.

KERR COUNTY
Herbert Oil Co.'s No. 1 J. D. Witt, 1,320 ft. N line, 1,320 ft. W line of Sec. 1,922, W. H. Hamilton Sur.... T. D. 200 ft.; standing.
Evans & Gant's No. 1 Seiker-Mears, C.C.S.D.&N.G.R.G. Sur. No. 1,605 ..... T. D. 3,821 ft.; drlg.
Evans & Gant's No. 1 E. Young, A. E. Burge Sur. No. 28 ..... T. D. 1,000 ft.; drlg.
Evans & Gant's No. 1 Love in J. Martinez Sur. No. 1,594, 1,320 ft. from W line of survey and 660 ft. S of S line of Sur. No. 1,597 ..... T. D. 3,600 ft.; drlg. in sand.
Evans & Gant's No. 2 Love, 150 ft. to S and W lines of Sur. 1,593 ..... T. D. 100 ft.; drlg.
B. M. Hatfield's No. 1 Westland, Blk. 23, Westland Subd. to Kerrville ..... T. D. 460 ft.; standing.

KIMBLE COUNTY
C. L. Bryant et al's No. 1 Lambert, 7,700 ft. N and W lines of F. Lotta Sur. ..... T. D. 850 ft.; standing.

KINNEY COUNTY
C. R. Cox et al's No. 1 Rose, 1,344 varas from NW line, 100 varas from SW line of A. B. Harper Sur. ..... Location abnd.

KLEBERG COUNTY
Barbee & Hunter's No. 1 Finnegan, 150 ft. from N and W lines of El Pasodezo Sur., 2 miles S of Ricardo .. T. D. 2,730 ft.; drlg.

LAVACA COUNTY
F. P. Zoch's No. 1 Dobard, 950 ft. from N line, 150 ft. from W line of T. G. Western Sur. ..... T. D. 3,248 ft.; in sand with odor of oil.

LIVE OAK COUNTY
Catlett & O'Neill's No. 1 Hatcher, 253 ft. from S line, 3,200 ft. from W line of 703-ac. tract in James McGloin Sur. ..... Derrick.
Henderson Coquat's No. 1 Hewitt ..... T. D. 400 ft.; drlg.

LEE COUNTY
Burt et al's No. 1 R. C. Saunders, J. Maxmilian Sur. .... T. D. 3,998 ft.; reaming 300 ft. off bottom.
A. H. Wheeler and associates' No. 1 fee, Blk. 47, H. Donohue Sur. ..... T. D. 3,315 ft.; fishing for bailer.
C. B. Polk et al's No. 1 Stoltz, Hiram Donohue Sur. .... T. D. 2,300 ft.; shut down.

McLENNAN COUNTY
C. E. Groone et al's No. 1 League ..... T. D. 1,230 ft.; shut down.

McMULLEN COUNTY
Belt Pet., Inc.'s No. 1 Martin, 150 ft. NW line, 150 ft. to SW line of E. Melon No. 212 Sur. ..... T. D. 28 ft.; standing.
Whall, Scherer et al's No. 1 Shiner, Henry Brewer Sur... T. D. 2,008 ft.; shut down.

MEDINA COUNTY
J. H. Hickey's No. 1 Jungman, at N end Chicon Lake .... T. D. 565 ft.; shut down.
Sunflower Oil Co.'s No. 1 Mofield, J. Brothag Sur. No. 532 ..... T. D. 2,010 ft.; drlg.
F. E. Tegler's No. 1 J. P. Nixon, 600 ft. from W line, 584 ft. from N line of tract, near Ina Field ..... T. D. 922 ft.; drlg.
Yancey Development Co.'s No. 1 Fassler, Sur. No. 801 .. T. D. 1,827 ft.; drlg.

MILAM COUNTY
Dil-Tex Oil Corp.'s No. 1 Dilbeck, 450 ft. N and E lines of farm, Fernando Rodriguez Sur. ..... T. D. 2,425 ft.; shut down.
H. Elliott's No. 1 Kirkman, 150 ft. from NE lines of farm in M. Park Sur., NW from Gabriel ..... T. D. 1,650 ft.; in Edwards with sulphur water.
Red Bank Oil Co.'s No. 1 Foster, A. G. Berry Sur. .... T. D. 1,375 ft.; drlg.
Wilson-Broach Co.'s No. 1 E. L. White, 250 ft. from S and E lines of S. Frost Sur. ..... Location.

NUECES COUNTY
Southern Crude Oil Pur. Co.'s No. 1 Charles E. Stratton, 1,650 ft. E line, 330 ft. S line of P. Sancho Sur. .... T. D. 600 ft.; set surface csg.

REAL COUNTY
McGinley Corp.'s No. 1 Haby, C of SW Sec. 175 ..... T. D. 2,165 ft.; fishing.
Gant-Kilgore and Evans' No. 1 A. D. Auld, C.C.S.D.& N.G.R.G. Sur. No. 23 ..... T. D. 4,007 ft.; fishing for bailer; will deepen.

SAN PATRICIO COUNTY
United Production Co.'s No. 1 Mayfield .. .. T. D. 1,640 ft.; drlg.

STAKE COUNTY
Los Olmos Oil Co.'s No. 5 Kelsey-Bass, 300 ft. N of No. 4 ..... T. D. 350 ft.; drlg.

TRAVIS COUNTY
Taylor Production Co.'s No. 2 Smith, 550 ft. from W line, 600 ft. S of No. 1 in Lemnel Kimbro Sur. ..... T. D. 940 ft.; drlg.

WEBB COUNTY
Cole Pet. Co.'s No. 4 Benavides, Sur. No. 1,601 ..... T. D. 2,732 ft.; drlg.
Eugene Garner, Jr.'s No. 1 Billings, 411 ft. E line, 956 ft. N line of NW NE, Sur. 71 ..... Building derrick.
Southern Gas Utilities and O. W. Killam's No. 1 de la Garza ..... T. D. 2,162 ft.; rigging up to deepen.

WILLIAMSON COUNTY
Hays & Gee's No. 1 E. G. Johnson, 1,800 ft. from N line, 170 ft. from E line of tract in B. C. Low Sur., S of Georgetown ..... T. D. 725 ft.; drlg.
Wilburn et al's No. 1 Caroline Hurts, P. Coursey Sur. .... T. D. 1,327 ft.; abnd.
Wilson et al's No. 1 Walker ..... T. D. 2,260 ft.; abnd.

WILSON COUNTY
A. M. Blume's No. 1 Nickolson, C. Diaz Sur. ..... T. D. 925 ft.; rigging up to bail.
Sun Oil Co.-Penn Oil Co.'s No. 1 Tudyke ..... Rigging up.

ZAPATA COUNTY
A. R. McLennan's No. 3 Cuellar ..... Rigging up.
T. H. Ward's No. 1 Uribe, 150 ft. NW line, 150 ft. SW line, Blk. 3 Subd., Share 7, Partition No. 6, T. Uribe Partition of Jose V. Borrego Sur. ..... Rigged up and standing.
Bill Henry et al's No. 1 Gopher Trust estate, Borrego grant ..... T. D. 1,365 ft.; standing.
Penny Prod. Co.'s No. 1 Juan V. Cuellar, Jr. et al, 175 ft. NE line, 175 ft. SE line Poppas Subd., Porcion 33 and 34, Blk. 1, Sur. 2 ..... T. D. 2,035 ft.; drlg.
National Oil Co.'s No. 1 Zapata Trust Estate, 617 ft. NW line, 96 ft. NE line, Blk. 97, De Prom Subd., Porcion 6 ..... T. D. 690 ft.; drlg.

National Oil Co.'s No. 2 Adams, 150 ft. from NW line and SW line, Blk. 11, Borrego grant ..... T. D. 1,320 ft.; drlg.

ZAVALA COUNTY

Lloyd North's No. 1 Mrs. Clay West Burns, 1,750 ft. N line, 3,100 ft. W line of 500-ac. tract in Sur. No. 200.. T. D. 1,200 ft.; abnd.

SOUTHWEST TEXAS PROVEN AREAS

(Continued from Page 38)

CHITTIM POOL—MAVERICK COUNTY

Texas Gas Utilities' No. 8 Chittim, 24 ft. S of No. 7 Chittim ..... T. D. 3,305 ft.; drlg.

SAXET FIELD—NUECES COUNTY

Gulf Coast Oil Co.'s No. 1 Maggie Harrall, 330 ft. from S and W lines of Blk. 32, Sec. 311 ..... T. D. 4,095 ft.; will drill deeper.

Houston Oil Co.'s (Andy Bowen) No. 1 Prieur, H. B. Sheppard Sur. ..... T. D. 1,465 ft.; abnd.

Houston Oil Co.'s No. 1 Lawrence ..... T. D. 2,740 ft.; preparing to complete as gasser.

Houston Oil Co.'s No. 2 Rand Morgan ..... T. D. 5,957 ft.; drlg. shale.

L. L. Smith's No. 1 Hunter, 150 ft. from S and W lines of N half of Hunter tract ..... T. D. 5,388 ft.; plugged back to 3,320 ft. to test.

WHITE POINT FIELD—SAN PATRICIO COUNTY

Saxet Oil Co.'s No. 4 White Point ..... T. D. 5,750 ft.; plugged back to 1,900 ft.

LAREDO DISTRICT

KOHLER POOL—DUVAL COUNTY

Humble Oil & Refining Co.'s No. 50 Kohler, 2,805 ft. from S line, 165 ft. from W line of Sur. 164..... T. D. 6,696 ft.; drlg.

COLE POOL—WEBB COUNTY

F. P. Zoch and Trinity Drillers' No. 1 Cuellar, 1,200 ft. from NW and SW lines of Share No. 2, W of Bruni.. T. D. 1,335 ft.; drlg.

JENNINGS-MUCKELOY POOL—ZAPATA COUNTY

Pray & Chamberlain's No. 5 Garza, 750 ft. to NW line, 450 ft. to NE line, Blk. 1, Zorro Subd. of Comitas grant ..... T. D. 995 ft.; drlg.

CAROLINA-TEXAS POOL—WEBB COUNTY

George S. Marshall's No. 1 Benavides, 660 ft. from S line, 150 ft. from E line of Sur. 683 ..... Location.

GULF COAST FIELDS AND WILDCATS

(Continued from Page 40)

HANKAMER—LIBERTY COUNTY

Gulf Prod. Co.'s No. 14 Boyt, H.&T.C. Sur. No. 22, 500 ft. N of No. 10 ..... Drlg. sand and shale showing oil 4,494 ft.

MOSS BLUFF—LIBERTY AND CHAMBERS COUNTIES

Humble Oil & Ref. Co.'s No. 7 Sterling, J. McFaddin Sur., 350 ft. S and 100 ft. W No. 6 Sterling ..... Total depth 6,426 ft.; set 36 ft. 2½-in. screen 6,355 ft.; swabbing showing salt water.

REFUGIO—REFUGIO COUNTY

Houston Oil Co.'s No. 6 Pratt-Hewitt-Rooke (D.D.), Thomas Mullen Sur., 1,150 ft. N and 200 ft. W of SE cor. of tract ..... Sand showing oil 3,705 ft.; 5 3/16-in. csg. at 3,678 ft. parted; sidetracking 3,285 ft.

Mission Drilling Co.'s No. 2 J. J. O'Brien, Refugio town 1½-acre tract ..... Drlg. sticky shale 5,145 ft.

tract, 150 ft. from E line and 150 ft. from S line

Moody-Seagraves Producing Co.'s No. 4 O'Connor, Refugio Town Tract, 150 ft. from N line and 1,282 ft. from W line of 60-acre tract..... Rig up to deepen 5,456 ft.

T. P. Morgan's No. 1 Lambert, Refugio town tract, 450 ft. from N line and 650 ft. from W line of 105-acre tract ..... Drlg. shale and lime 4,936 ft.

Pearson Properties' No. 5 Ryals, 174 ft. from S line of lease and 475 ft. E of No. 3 ..... Oil sand 6,403-11 ft.; cmtd. 6⅝-in. csg. 6,400 ft.

United Prod. Corp.'s No. 6 O'Brien, 150 ft. from S line of tract, 350 ft. W No. 3 ..... Oil sand 6,438-51 ft.; cmtd. 7-in. csg. 6,438 ft.

United Prod. Corp.'s No. 1-B W. J. Fox, Wm. Hews and L. Brown Sur., 2,541.7 ft. NE along SE line from SE cor. lease and 330 ft. NW at right angles ..... Drlg. sand and boulders 3,914 ft. and L. Brown Sur., 2,514.7 ft. NE along NW line

United Prod. Corp.'s No. 4 M. F. Lambert, Wm. Hews from SW cor. lease and 330 ft. SE at right angles... Rig.

United Prod. Corp.'s No. 5 Holmes Heard, 660 ft. from N line and 2,375 ft. from W line, Blk. 8, town tract.. Coring sand 3,763 ft.

SOUTH LOUISIANA FIELDS

LOCKPORT—CALCASIEU PARISH

Vacuum Oil Co.'s No. 5-A Farquahar, 105 ft. S and 110 ft. E of NW cor. SW NE Sec. 8-10s-9w ..... Drlg. sand 3,720 ft.

JENNINGS—ACADIA PARISH

Port City Oil Co.'s No. 13 Jennings-Heywood, 2,650 ft. NW of SE cor. N one-fourth of fractional Sec. 41 9s-2w, 675 ft. from the W line ..... No report.

Yount Lee Oil Co.'s No. 10 Housierre-Latrielle, 5,435 ft. E and 1,070 ft. N of SW cor., Sec. 47-9s-2w ..... Rig.

EDGERLY—CALCASIEU PARISH

Rex Pet. Co.'s No. 2 Prairie Narroni, Sec. 21-9s-11w, 360 ft. from S line and 50 ft. from E line of lease ..... Total depth 4,143 ft. in salt; sidetracked to 4,060 ft.; set 10 ft. 3-in. screen; tested salt water; standing.

HACKBERRY—CAMERON PARISH

R. E. Seiss' No. 2 J. M. Vincent ..... Total depth in rock 2,042 ft.; cmtd. 6⅝-in. csg. 2,004 ft.

The Texas Company's No. 8 State ..... Derrick.

Yount Lee Oil Co.'s No. 34 State ..... Location.

Yount Lee Oil Co.'s No. 36 State ..... Location.

Yount Lee Oil Co.'s No. 37 State ..... Location.

Yount Lee Oil Co.'s No. 38 State ..... Location.

Yount Lee Oil Co.'s No. 39 State ..... Location.

VINTON—CALCASIEU PARISH

Vinton Pet. Co.'s No. 7 Matilda Gray (D.D.), 157 ft. N and 674 ft. W of SE cor. SW NE of Sec. 33-10s-12w.. Set 15 ft. 3-in. screen 3,124 ft.; tested salt water; to deepen.

FORT BARRE—ST. LANDRY PARISH

The Texas Company's No. 10 Botney Bay, Sec. 4-6s-5e, 100 ft. S line and 100 ft. E line, Daniel 55-acre tract.. Drlg. sandy shale 3,700 ft.

SWEET LAKE—CAMERON PARISH

Magnolia Pet. Co.'s No. 2 Sweet Lake, Sec. 5-13s-7w ..... Drlg. dry sand 5,775 ft.

Pure Oil Co.'s No. 5 Yount Lee (D.D.), Sec. 12-13s-8w ... Fishing screen and liner to deepen 5,658 ft.

SULPHUR—CALCASIEU PARISH

Union Sulphur Co.'s No. 767 fee, 328 ft. E and 180 ft. N of C Sec. 29-9s-10w ..... Drlg. 3,348 ft.

MISCELLANEOUS WILDCATS

TEXAS

AUSTIN COUNTY

Parmerson & Cafferkey et al's No. 1 W. N. Schlecte, John Fitzgibbons Sur., 1,850 ft. from SE line and 3,100 ft. from NE line of survey ..... Shut down 1,502 ft.

BRAZORIA COUNTY

The Texas Company's No. 1 Belcher, Manvel, 167 ft. SE of NW line and 223 ft. of NE of SW line, Lot 18, Blk. A, Suburban Gardens Subd. ..... Drlg. sand and shale 3,553 ft.

United North & South Oil Co.'s No. 1 Daisy B. Lewis, S. F. Austin 5 league, 568 ft. S and 325 ft. E from NW cor. 100-acre tract ..... Drlg. sandy shale 3,940 ft.; drill stem test 3,840-3,940 ft. showed salt water.

United Oil Syndicate's No. 1 Levitt, 900 ft. from W line and 400 ft. from S line of John Peske Sur. ..... Rig.

BURLESON COUNTY

Reynolds Oil Co.'s No. 1 Harris, 500 ft. from W line and 400 ft. from N line of J. M. McKean Sur. ..... Shut down 400 ft.

Marts et al's No. 1 W. H. Boyett, W. McWilliams Sur., 3,168 ft. N of N cor. of City National Bank 208-acre tract and 300 ft. SE of NW line of Boyett tract.. Location.

J. E. Stubblefield's No. 1 J. B. Mitchell, 81 ft. SW and 4,340 ft. SE of S cor. of Joseph Henson Sur., in A. T. Woolridge Sur. ..... Shut down 518 ft.

CALHOUN COUNTY

The Texas Company's No. 1 Smith, J. Timmons Sur., Will Mousin and Driscoll Subd. ..... Abandoned in sand and shale 6,500 ft.

FORT BEND COUNTY

Cullen & West and Gulf Prod. Co.'s No. 1 A. P. George, J. Rabb Sur., 300 ft. S and 305 ft. E of NW cor. A. P. George 519-acre tract ..... Rig.

Cullen & West's No. 1 Nash, Thomas Alsbury Sur. No. 4, 2,600 ft. E and 1,240 ft. S of SW cor. Mrs. R. L. Young 1,483-acre tract ..... Rig.

GRIMES COUNTY

Rianjo Oil Co.'s No. 2 Cuthrell, Pat B. O'Connor Sur., C of 110-acre tract ..... Derrick.

HARDIN COUNTY

Plummer & McDaniel's No. 1 T. S. Reed, 2,500 ft. from W line and 500 ft. from N line of T.&N.O. Sur. No. 296 ..... Shut down in gumbo and lime 1,326 ft.

D. O. Speight's No. 1 Guedry, 4 miles S of Batson..... Drlg. sand 3,765 ft.

HARRIS COUNTY

Hattie Baldwin's No. 1 Krahn, 250 ft. out of NW cor. L. Finn Sur. ..... Shut down 492 ft.

Cypress Oil & Dev. Co.'s No. 1 C. Fritz, 500 ft. from N line and 500 ft. from E line of J. Duckworth Sur. ... Abandoned in shale and gumbo 1,521 ft.

Givens & Daybault's No. 1 Lobit, David Middleton Sur., Blk. 19, Lobit Subd. ..... Location.

Humble Oil & Ref. Co.'s No. 5 Minnetex, Mykawa, 150 ft. from S line and 200 ft. from W line, Lot 261, Wm. Lovett Sur. ..... Location.

Humble Oil & Ref. Co.'s No. 6 Minnetex, Mykawa, Wm. Lovett Sur., C of Lot 254 ..... Total depth 5,899 ft.; plugged to 5,106 ft.

JACKSON COUNTY

Chicago-Gulf Co.'s No. 1 Rogers (workover) ..... Drill stem test 3,952 ft. showed dry gas, 1,100 lbs. pressure; cem. 6⅝-in. casing 3,945 ft.

Francitas Oil & Land Co.'s No. 1 Thrull, 3,260 ft. SW of N cor., P. Green Sur., 540 ft. SE of E bank Carancahua Creek ..... Derrick.

LIBERTY COUNTY

J. R. Ingram's No. 1 C. T. Palmer, James Fenner Sur., 1,000 ft. from W line and 850 ft. from S line of tract.. Drlg. water sand 1,350 ft.

Hamm et al's No. 1 Harvard, Davis Hill ..... Gumbo 1,015 ft.; shut down.

Tucker et al's No. 1 Bell, H.&T.C. Sur. No. 4 ..... Drlg. shale 2,212 ft.

MATAGORDA COUNTY

H. C. Cockburn's No. 3 Hawkins, Shepherds Mott, 4,810 ft. SE along SW line of Farnum Fry Sur., thence 242 ft. NE at right angles ..... Heaving shale 5,034 ft.; drill stem stuck.

MONTGOMERY COUNTY

H. W. Lowrie, Jr.'s No. 1 Groggan (G. J. Sunday), Cyrus Wickerson Sur. ..... Abandoned in shale 4,755 ft.

Price & Wilhite's No. 2 Juerges ..... Drlg. sticky shale 4,555 ft.

ORANGE COUNTY

Altex Oil Co.'s (Veteran Oil Co.) No. 1 Reed, A. Nelson Sur. No. 1, 500 ft. from N line and 250 ft. from E line of tract ..... Formerly temporarily abnd. 4,603 ft.; sidetracked hole 1,200 ft.; drilled to 1,820 ft.; shut down.

Crew Oil Co.'s No. 1-A Mansfield, 50 ft. E of No. 1 ..... Shut down in water sand 1,375 ft.

POLK COUNTY

Freeman et al's No. 2 Freeman ..... Shut down 3,124 ft.

T. B. Hoffer's No. 1 Saner-Ragly Lbr. Co., 300 ft. out of most northerly cor. of most easterly County School Land Abst. 271 ..... Derrick.

Sunshine Oil Co.'s No. 1 Olliver, A. Viesca Sur., 600 ft. NE along SE line from S or SW cor. of 50-acre tract and thence 200 ft. NW at right angles ..... Location.

REFUGIO COUNTY

Blanco Creek Oil Co.'s No. 1 Damaan, 150 ft. from N line and 150 ft. from W line of Blk. 16, Bonnie View Ranch Subd. ..... Standing 4,200 ft.

Humble Oil & Ref. Co.'s No. 1 O'Connor, John Keating Sur., 6,012 ft. S from NE cor. along SE line of Lon T. Rios Sur., thence 7,375 ft. W at right angles in John Keating Sur. ..... Location.

SAN JACINTO COUNTY

E. P. Edward et al's No. 1 Bennett, northwest of Cold Springs ..... Spudded and shut down.

TYLER COUNTY

King Oil Co.'s No. 1 Caswell ..... Sand and shale showing oil 1,255 ft.; cmtd. 6-in. csg. 1,218 ft.

Allied Pet. Co.'s (Texas Southern Pet. Co.'s) No. 3 Wilson, Mrs. E. Cherry Sur. No. 798, 1,500 varas from W line and 600 varas from N line ..... Drlg. shale and hard sand 4,960 ft.

Lew Wentz' No. 1 Mann, James Seals Sur., 330 ft. out of SW cor. 804.25-acre tract ..... Abandoned in shale 2,870 ft.

VICTORIA COUNTY

Houston Oil Co.'s No. 1 Conrad, T.&N.O. Sur. No. 1, 1,100 ft. from SW line and 100 ft. from NW line .... Drlg. shale 3,826 ft.

Simpson-Fell and Westheimer et al's No. 1 Levi, 2,200 ft. from SW line and 2,000 ft. from NW line of S.A.&M.G. Sur. No. 4 ..... Drlg. hard lime 5,018 ft.

The Texas Company's No. 3 McFaddin, S 15° W, 6,200 ft. and N 75° W 1,850 ft. out of NE cor. John M. Rine Sur. ..... Drlg. sand and boulders 1,377 ft.

United Prod. Corp.'s No. 4-A McFaddin, M. Traviesa Sur., 1,320 ft. W along N line of C. L. Mann Sur. from NE cor. and 1,980 ft. N at right angles ..... Sand showing gas 3,752-62 ft.

WALLER COUNTY

McDaniel and associates' No. 1 Citizens State Bank, B.B.B.&C. Sur., C of 150-acre tract ..... Rig.

WASHINGTON COUNTY

Joe Baker et al's No. 1 Kramer, Brenham, 600 ft. S and 300 ft. W NE cor. 92 acres ..... Drlg. hard sandy lime 3,120 ft.

Cord Oil Co.'s No. 1-A Hahn, 500 ft. from N line and 1,852 ft. from W line of J. H. Alcorn Sur., Abst. 3... No report.

Fisher and associates' No. 1 H. F. Scholtz, S. F. Austin Sur., 1,100 ft. NW along NE line from SE cor. of 107-acre tract and thence 12 ft. SW at right angles.. Drlg. sand and lime 390 ft.

Penn-Tex. Oil Co.'s No. 2 Kamas Brenham, S. M. Williams Sur. ..... Drlg. sandy shale 3,130 ft.

Yequa Oil Co.'s No. 1 Graves, S. Clampit Sur., 200 ft. from N line and 900 ft. from W line 111-acre tract.. Shut down in hard shale 2,565 ft.

SOUTH LOUISIANA
CALCASIEU PARISH

Crawford Doyle's No. 1 Johnson, Sec. 23-9s-13w ..... Shut down 875 ft.
J. O. Davis' No. 1 Industrial, Sec. 29-9s-10w ..... Standing 6,568 ft.
Wilfred Lahay's No. 1 Jardell, Sec. 16-10s-12w ..... Shut down 3,258 ft.
Dr. Thomas et al's No. 1 John Hewitt ..... Location.
Vacuum Oil Co.'s No. 1 Wait (D.D.), 225 ft. out of SE cor. Sec. 12-9s-7w ..... Sand showing oil 6,961-79 ft.; cmtd. 1 jt. screen and full string of 7-in. csg.

CAMERON PARISH

Vacuum Oil Co.'s No. 2 Cameron Meadows, 3,120 ft. S and 1,900 ft. W from NE cor. Sec. 21-14s-9w (500 ft. S No. 1) ..... Drill stem stuck 4,312 ft.; changing rigs.
The Texas Company's No. 7 State, Calcasieu Lake ..... Location.

IBERIA PARISH

Jefferson Lake Oil Co.'s No. 17 Lake Peigneur, Jefferson Island, Sec. 58-12s-5e, 300 ft. SE No. 11 and 285 ft. NE of No. 5 ..... Cap 770-74 ft.; abandoned.
Jefferson Lake Oil Co.'s No. 18 Lake Peigneur, Jefferson Island, Sec. 58-12s-5e, 300 ft. E No. 5 ..... Drlg. cap rock 800 ft.
Jefferson Lake Oil Co.'s No. 19 Lake Peigneur, Sec. 58-12s-5e, 300 ft. from No. 5 in line with Nos. 5 and 18 ..... Location.

IBERVILLE PARISH

Standard Oil Co.'s No. 1 Wilbert-Choctaw, Bayou Choctaw, Sec. 52-9s-11e, 250 ft. W No. 1 Gay ..... Location.
Standard Oil Co.'s No. 7 Wilbert, Bayou Blue .....
Standard Oil Co.'s No. 6 Schwing, Bayou Blue, Sec. 73-9s-11e, 317 ft. S of No. 3 ..... Drlg. gumbo 3,340 ft.
Standard Oil Co.'s No. 7 Schwing, Bayou Blue, Sec. 74-9s-10w, N 45°, W 1,800 ft. from No. 5 ..... Total depth 1,350 ft.; sand showing oil 1,307-12 ft.; shut down pending completion No. 6.

PLAQUEMINES PARISH

Humble Oil & Ref. Co.'s No. 2 State, Lake Grand Ecaille, Sec. 14-20s-26e ..... Rig.

ST. MARTIN PARISH

Federal Pet. Co.'s No. 1 Dangareaux, 11,200 ft. from W line and 50 ft. S of NE cor. of Sec. 140-9s-5e ..... Drlg. shale 2,866 ft.

TERREBONNE PARISH

The Texas Company's No. 6 State, Caillou Island ..... Drlg. cap rock 4,527 ft.
The Texas Company's No. 1 La.L.&E., Bay St. Elaine ... Drlg. shale 5,683 ft.
The Texas Company's No. 3 La.L.&E., Bay Junop ..... Location.
The Texas Company's No. 4 La.L.&E., Bay Junop ..... Location.
The Texas Company's No. 6 State, Lake Barre ..... Salt 3,848-4,001 ft.; straightening hole.
The Texas Company's No. 10 State, Lake Barre ..... Location.
The Texas Company's No. 11 State, Lake Barre ..... Building derrick.
The Texas Company's No. 12 State, Lake Barre ..... Location.
The Texas Company's No. 13 State, Lake Barre ..... Hard sand 4,200 ft.
The Texas Company's No. 14 State, Lake Barre ..... Location.

VERMILLION PARISH

Pure Oil Co.'s No. 1 Alliance Land, Sec. 34-11s-1w, 2,600 ft. N and 300 ft. E of SW cor. section ..... Drlg. soft sandy shale 5,098 ft.

WEST FELICIANA PARISH

Putnam Syndicate's No. 2 Como Plantation, Sec. 51-1s-4w. Shut down for repairs 1,776 ft.

LA.-ARK. FIELDS

(Continued from Page 41)

operators decided to junk the well and drill an offset, using the gas from the original to fire the boilers for the second test.

ARKANSAS

The Lion Oil Co.'s wildcat test, No. 9-A G. P. Hays, Section 4-16-15, in the proven area of Union County, Arkansas, continues to hold the spotlight in that State. After failing to make a producer from 4,004-25 feet, drilling and coring has proceeded cautiously. Sandy shale was encountered from 4,275-97 feet and a core from 4,297 to 4,303 feet showed hard white sand with a small show of oil. The operators are arranging to continue coring as drilling progresses. In the Urbana Field of Union County, Wilson & Chapman's No. 1 Adkins, Section 3-18-13, cored ash and sandy shale, showing oil, from 3,591-96 feet. A drill stem test showed 1,600 feet of oil in the hole, with no water. Casing will be set at 3,591 feet and the well bailed in, making the second good producer for these operators within a few weeks.

MISSISSIPPI

Six new operations have been started in Mississippi within the past two weeks, three of which were in the proven or semiproven gas areas of Hinds and Rankin Counties, and three were wildcats in widely scattered sections of the State. In Webster County, P. J. McAlpine has begun operations on No. 1 Henly, Section 15-21n-11e. This well, originally known as the Cumberland Oil Co.'s No. 1 Henly, was abandoned September 15, 1929, at 1,960 feet with 1,420 feet of 8-inch casing in the hole. The other new wildcats are Bob Talton and others' No. 1 K. D. Majure, Section 25-6n-11e, in Newton County, and Stokes and Cleve Love's No. 1 Phillips, Section 14-10n-2w, in Jefferson County. The Ohio Oil Co. has reached a total depth of 4,308 feet on its No. 1 Cantrell, Section 16-15-5, Clay County. Cable tools are being used in making this test, and at present operations are suspended pending repairs to the rig. Other wildcats in Mississippi are as follows: Eagle Bend Oil & Gas Co.'s No. 1 Kiger, Section 9-18-2, Warren County, drilling at 2,190 feet; Mississippi Drilling Co.'s No. 1 Scarborough, Section 15-13-15, in Winston County, cored sandy shale from 3,312-14 feet and is now drilling at 3,380 feet, and the Collett-Carter Oil Co.'s No. 2 Blackmere, Section 14-11-14, Yalobusha County, is drilling in hard blue shale at 3,462 feet.

Daily Average Production

A net increase of 45 bbls. daily was reported, North Louisiana increasing 265 bbls. and Arkansas decreasing 305 bbls. Daily average runs for the several pools were:

NORTH LOUISIANA

Caddo, light	7,060
Caddo, heavy	2,690
Homer	3,090
Haynesville	5,420
DeSoto and Red River	2,530
Bellevue	470
Cotton Valley	720
Urania	4,090
Pleasant Hill	390
Sarepta-Carterville	1,000
Zwolle	7,000
Holly	495
Total North Louisiana	35,955
Total previous week	35,690
Increase	265

ARKANSAS

El Dorado	3,480
Smackover, light	4,055
Smackover, heavy	29,310
Stephens	750
Nevada	1,210
Lisbon	700
Champagnolle	2,640
Urbana	1,770
Total Arkansas	43,915
Total previous week	44,220
Decrease	305
Total both states	79,865
Total previous week	79,910
Decrease	45

SOUTHWEST TEXAS FIELDS

(Continued from Page 38)

Refugio Field, Blanco Creek's No. 1 Denman at 4,180 feet had a showing in sand but it tested salt water. It is a test that lines up with the Refugio and White Point Fields.

Kerr-Real District

Almost no progress was made the past week in the Real-Kerr County district but Evans & Gant's No. 1 Seiker-Mears made some new hole and is down to 4,031 feet, the test being in Kerr County and 4 miles north of No. 1 Love. Other operations have made little progress, however.

In the territory west of San Antonio along the Balcones fault, Sunflower Oil Co.'s No. 1 Mofield, 3 miles west of the Ina oil field, at 2,040 feet in the Edwards and first thought to have a chance, is dry. It is being plugged back and will test some showings in the upper formations. It topped the Edwards at 1,988 feet.

There is a little drilling around Chicon Lake in eastern Medina County but it has made but slow progress the past week.

In northern Zavala County, Lloyd North topped Serpentine at 925 feet in No. 1 Mrs. Clay West Burns but at 1,200 feet it is dry and abandoned. Serpentine has been encountered frequently in that area. The test was drilled to get shallow gas producing on the West Ranch just south of it. There is a chance that it may be carried deeper.

Laredo District

Ike Howeth's No. 1 Singer in Brooks County, drilled near a Humble Oil & Refining Co. test on the same ranch that had a good shallow showing, is now at 2,230 feet, having topped a sand at 2,228 feet after going through a cap rock. There is a good showing of oil and gas and it will make a test.

J. W. O'Byrne's No. 1 Weil Brothers in Duval County, 5 miles southwest of the Schoolfield-O'Byrne Pool, is in a sand at 2,630 feet and making a test.

Other than those the Laredo district is rather inactive. In Webb County the test of interest is Zoch's No. 1 Cuellar, a mile west of the town of Bruni, which is down 1,900 feet. Another week's drilling will get it to the horizon where production is had in the Cole Field at 2,350 feet and it is that sand which the test is feeling for.

CANADIAN FIELDS

(Continued from Page 44)

that if Hudson's Bay's No. 1 Keho is a producer, No. 2 Keho will be drilled on the William Oliver farm south of No. 1.

In the Taber district, Alberta Pacific Consolidated's No. 1 Cole-Hunter, LSD 3, Section 11-10-17w4, is reported making new hole after drilling through cement at 3,330 feet, following a production test.

On the Spring Coulee structure, Alberta Pacific Consolidated's No. 1 has finished recementing and is reported cleaning out with cable tools preparatory to shooting a number of oil sands drilled through on the way down.

In the Milk River area, Commonwealth Petroleums' No. 1, LSD 9, Section 9-3-15w4 is reported drilling close to 5,000 feet in the lower Devonian.

Tests in the Foothills

In the southern foothills, the Watson structure near Lundbreck appears likely to get a conclusive test this season. Last year Source Rock Petroleums' No. 1, LSD 13, Section 21-9-2w5, was spudded in but was carried to only about 200 feet, and has been standing at this depth for some months. It is claimed the well at this depth got shows of shallow oil, though nothing approaching commercial production. Since then, Raven Oils' No. 1 has spudded in a test north of Lundbreck, and is reported drilling at 165 feet. The Watson structure is a continuation of the foothill belt of which the Turner Valley Field forms a portion, but owing to the isolated locality and transportation difficulties, actual development work has been considerably delayed, though geological reports on the structure have been very favorable.

In the High River-Aldersyde area, Ranchmen's Gas & Oil Co.'s No. 1, LSD 16, Section 13-20-29w4, is reported drilling close to 4,900 feet, with small shows of oil and gas continuing.

Red Coulee Field

In the northwest extension of the Red Coulee Field, Dalco Oil & Gas Co.'s No. 2, LSD 7, Section 19-2-17w4. is reported drilling around 3,100 feet.

In the Vanalta area close to the international boundary, the various wells on the Canadian end of the structure are showing only slight falling off in production, though there have been no recent new completions. Southern Alberta Exploration Co.'s No. 2, Section 3-1-16w4, was a decided disappointment; lying only 440 feet east of Southern Alberta's No. 1, a good average producer, it got only a small show and was abandoned after drilling to 2,600 feet. Devonshire Oils' No. 1, LSD 3-4, Section 10-1-16w4 has also been abandoned, Alberta Pacific Consolidated Oils, Ltd. deciding not to go ahead with completion of the well after water was found in the hole, which had been standing at around 2,000 feet.

There is some talk of a new test on the west fold of the structure in Township 1-17w4. Imperial Oils' No. 1 Red Coulee, a wildcat, drilled a number of years ago, got an oil show in this general area, and Kotop Oils' No. 1 in LSD 1, Section 2-1-17w4, was carried to around 1,600 feet and got shows of both oil and gas, though at this depth it had not reached the horizons found productive in the Vanalta section of the field. The Kotop well was abandoned owing to drilling difficulties, and the area has never been conclusively tested.

Wainwright Field

In east central Alberta, there has been some renewal of activity in the Wainwright Field. Montreal-Alberta Petroleums' No. 1, LSD 2, Section 15-46-7w4, is reported resuming after setting the first string of casing around 625 feet. Rotary tools are being used at the present depth, but the hole will be finished with cable tools. The outfit is running two shifts with Field Manager M. J. Williamson in charge. The company is reported prepared to test the lime if commercial production is not found in the Wainwright sand. The location is about 2 miles northwest of Wainwright.

It is reported that the old Atkins Petroleum Syndicate's No. 1 location in LSD 9, Section 18-45-6w4, adjoining the Aykroyd estate holdings, will be taken over and the well completed by Strathmore Oils, Ltd. Derrick is up and machinery is being installed for the test. Fabyan Petroleums' No. 3 derrick has been re-erected, and some machinery is on the ground. It is expected the test will resume active work this summer.

British Columbia Test

On Lulu Island, British Columbia, Altamont Oil Co.'s No. 1, south of Steveston, is reported rigged up ready to spud in. Rotary tools will be used for the test.

Imperial Drilling

In South Turner Valley, Southern Lowery's No. 2, LSD 13, Section 9-19-2w5, has been completed in the lime around 4,632 feet, and is now reported in steady production. No information has been given out as to the potential crude naphtha recovery, but the well looks like a fair producer.

Completion of this test leaves Imperial Oil, Ltd., with only four tests active in the Turner Valley Field. Southern Lowery's No. 3, LSD 4, Section 9-19-2w5, is drilling at 4,111 feet. Lowery Petroleums' No. 2, NW, Section 17-19-2w5, is drilling at 6,514 feet, within less than 100 feet of making a new depth record for Canada. South West Petroleum Co.'s No. 2, Section 8-19-2w5, is at 5,407 feet and waiting for casing roller. Sterling Pacific Oil Co.'s No. 2, LSD 10, Section 33-18-2w5, is drilling at 1,045 feet.

Shareholders of Midwest Oil Co. met at Calgary recently, when a proposition made by Imperial Oil, Ltd., for a test on the Midwest acreage was rejected. Directors elected were Alexander Hannah, J. H. McLeod, A. Hinds, L. H. Phillips and W. Pearce.

Central Turner Valley

In the Central Turner Valley, Okalta Oils' No. 1, LSD 1, Section 1-20-3w5, is deepening in the lime. This well started a couple of years ago with a flush production estimated around 400 bbls. a day or better from the lime. A great deal of trouble was experienced owing to defective casing and the later production did not measure up to early indications. Recently the well was reconditioned and put in good shape, and production will be taken while it is deepened to a second porous horizon in the lime. The old bottom stood at 5,040 feet and another porous horizon is looked for around 5,150

feet; some additional gas has already been encountered in deepening.

Dome Oils' No. 2, LSD 16, Section 36-19-3w5, is drilling about 150 feet in the lime at 5,305 feet, with some gas production.

In the north central section, Vulcan Oils' No. 3, LSD 11, Section 13-20-3w5, is drilling around 3,000 feet with about 800 feet of light crude in the hole. The crude apparently comes from a horizon in the Blairmore and the well may be a small commercial producer at this depth.

North Turner Valley

In the North Turner Valley, United Oils' No. 4, LSD 2, Section 24-20-3w5, is drilling in the Pokerchip shales at 5,960 feet and should get the lime around 6,000 feet. Casing is being carried down behind the tools. This is the only test now active in the north end. Two previous north end wells, Foothills Oil & Gas Co.'s No. 1 and Model Oils' No. 1, got production in the lime at great depth but have held up remarkably well, Model's No. 1 materially increasing its recovery with steady production. Several years ago a large number of tests were started in the north end of the field, but owing to the deep drilling required most of them discontinued operations before reaching any conclusive depth.

Highwood Test Abandoned

On the Highwood structure, Hudson's Bay Oil & Gas Co.'s No. 1 Highwood, LSD 8, Section 1-18-3w5, is reported to have been definitely abandoned at around 3,510 feet. The test got the Madison limestone at 2,150 feet and was carried 1,360 feet below the contact; it is unofficially reported to have got about 3,000,000 feet of gas and has been standing since last fall, pending a decision with regard to deeper drilling.

Southern Red Coulee

Askalta Oils' No. 2 Cosmos is reported drilling below 1,950 feet with a new show of gas, and is preparing to run 12-inch casing before deepening to the oil sand.

Mirror Landing Test

In the Mirror Landing area, northern Alberta, Crudome Oils' No. 1, LSD 16, Section 24-72-25w4, is expected to start drilling shortly after July 15. The immediate district has never before been tested for oil, though International Oils, Inc., of New York, drilled two tests at the eastern end of Lesser Slave Lake, about 30 miles west and slightly north of the Crudome acreage. The International wells got good oil and gas showings but failed to develop commercial production. West of Lesser Slave Lake, Prairie Oils' No. 1, Section 23-74-17w5, on the High Prairie structure was carried to 2,205 feet but failed to get commercial production. The present drilling is understood to be preliminary to a deep test, and it is possible that four tests will be drilled on different parts of the holdings to check up the structure. The company was financed in eastern Canada, with head office at Toronto, and the operations are in charge of J. H. McCorkindale, a veteran oil operator.

Wainwright Field

In the Wainwright Field, east central Alberta, Strathmore Oils, Ltd., has taken over the Edmonton-Wainwright Oils' No. 1 and British Petroleums' No. 4 wells and is preparing to clean them out and restore production. The crude will probably be handled by the Associated Refineries at Wainwright.

British Columbia Tests

In the Sage Creek district, Crow's Nest-Glacier's No. 1 has been working for some time cleaning out and swabbing. The well is down approximately 3,260 feet where a strong show of light crude, with some gas, was struck a couple of years ago.

KANSAS FIELDS

(Continued from Page 35)

27-33-4, is dry and abandoned at 685 feet.

Greenwood County

York State Oil Co. moved a machine in for No. 1 Rice, SW cor. NW, Section 22-23-11.

Marion County

Youker and others' No. 3 Riffel, NW cor., Section 11-17-4, has been completed for 50 bbls. in chat 2,311-96 feet.

Morris County

Allender and others' No. 1 Bersuch, NW cor. NE SE, Section 16-17-7, is spudding.

McPherson County

Herndon Drilling Co. and others made location for No. 1 Peterson, C SW NE, Section 2-19-2w. McPherson Oil & Gas Co. and Shell Petroleum Corp. made location for No. 2 Lovett, C SW NW, Section 13-19-2w. Olson Drilling Co. and Shell Petroleum Corp. staked location for No. 4 Koehn, SW cor. NE SW, Section 36-19-2w. Shawver and Shell Petroleum Corp. made location for No. 1 Kaegi, NW cor., Section 21-19-1w. Sinclair Oil & Gas Co.'s No. 2 McCurdy, SW cor. SE SE, Section 33-20-3w, has been completed for 1,200 bbls. in Silicious lime 3,328-31 feet after being deepened. McPherson Oil & Gas Co. and Shell Petroleum Corp.'s No. 2 Wallace, C NW SW, Section 12-19-2w, has been completed for 2,193,000 feet of gas in chat 2,-904-31 feet. Carey and The Texas Company's No. 1 Holt, C NW SE, Section 13-19-2w, made 2,500,000 feet of gas in sand 2,942-46 feet. McPherson Oil & Gas Co. and Shell Petroleum Corp.'s No. 3 Meyers "B," C NE SE, Section 14-19-2w, made 20,289,000 feet of gas from chat 2,891-2,931 feet. Darby Petroleum Corp.'s No. 1 Kaegi "B," SE cor. SW NE, Section 20-19-1w, has been completed for 17,000,000 feet of gas in sand 2,-917-68 feet.

Reno County

Tom Palmer and Phillips Petroleum Co.'s No. 1 Goering, NW cor. SE, Section 1-23-4w, made 21,000,000 feet of gas from chat 3,280-3,350 feet.

Sedgwick County

Shell Petroleum Corp.'s No. 2 Lygrisse "A," NE cor., Section 15-26-2, is rigging up to drill deeper from 2,872 feet.

70,000,000-FOOT GASSER IN TIOGA COUNTY, PA.

(Continued from Page 36)

are such that it would warrant his company changing from artificial to natural gas. In a statement made public in Rochester to the effect that his company contemplates no change he explained the recent action of the common council of that city in resolutions directed to arouse popular interest in the gas development underway in this territory, particularly in the Wayne Field.

The statement by Mr. Russell goes into careful detail as to the geological formation necessary to produce natural gas, minutely and at length describing formations necessary for a sustained flow of gas, he continues:

"In this region under discussion large proven areas worthy of consideration have been found only in two places, that is the Wayne-Dundee section and in the Tioga section of the Northern Pennsylvania. As yet all other anticlines have proven barren and there have been a great many dry holes of which we never hear. Many of these dry holes have been drilled to the very cellar sedimentary rocks which prove that drilling to deeper structures in this section offers little prospect of value.

Wells Too Close

"Numerous producing wells are reported weekly in the paper but most of them are of little significance, since they are merely another pricking of the same bubble. In some sections wells are placed so close to one another as to be of no economic value to the owner or anyone else. Unless the drilling of wells extends the proven area of the field, additional wells are a detriment rather than an asset to the field, since they increase the chance of leakage from the field. Gas once lost is lost forever, since the process of gas formation was extinct ages ago.

"At present sufficient reserves in the Wayne-Dundee Fields have not been established to justify the large cost of a line to Rochester and the expense of changing the customers' equipment. This is true in the event this whole field were reserved for Rochester's use only, which of course is impossible as there are many cities nearer, such as Dundee, Watkins, Binghamton, etc., which are already being

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supplied from this field. There are similarly other towns near this field that may be economically supplied from it. We are following the development most intensively and have a vast amount of geology and drilling to date that give us a very accurate picture of the situation.

"The field in Tioga County of northern Pennsylvania has not as yet been clearly defined. There have been numerous indications of faults and dry holes in close proximity to wells of large capacity that have been most disconcerting. This field is nearer to Williamsport, Harrisburg and other Pennsylvania cities now supplied with artificial gas than Rochester."

For Orderly Development

NEW YORK, July 3.—Columbia Gas & Electric Corp. and Lycoming Natural Gas Co., eastern natural gas subsidiary of the Standard Oil Co. (New Jersey), are reported negotiating for a working arrangement to insure the orderly and economic development of the natural gas area in northeastern Pennsylvania and southwestern New York.

Production is being rapidly built up in these fields, and it is believed that natural gas from these areas will shortly be made available to some of the larger communities in the New York territory.

CALIFORNIA REFINERY PRICES REACTIONARY

LOS ANGELES, Calif., July 6.—Refined oil prices on the Pacific Coast were somewhat lower during the past week and uneconomic price cutting in the gasoline trade has become a disturbing factor especially in southern California and in the San Francisco Bay region. The decline in prices which started this week followed a short period during which prices were temporarily stabilized following cessation of the recent price war on June 19. Major marketers were obliged to restore their competitive price signs over the week end in order to combat price cutting and the situation has again reached a critical condition.

A concerted attempt is being made to prevent a general breakdown and while good business judgment demands a moratorium at least until October 1 by which time the peak demand for gasoline will have declined, it will require extreme care to keep from rocking the boat. An appeal is being made to secure public disapproval of price cutting and on the other end of the situation producers of crude oil have been informed that they must do their share to effect stabilization because if the price of refined oil declines, crude oil quotations will break also. It is the general belief that major marketers will leave prices undisturbed until after the summer season is over as this will permit partial liquidation of stocks on a more advantageous basis and permit refiners to increase cash reserves. The existing unsettled condition is especially interesting because a preliminary check up indicates that sponsors of the referendum against the Sharkey conservation bill have secured approximately 100,000 signatures. If the necessary valid signatures are secured and the referendum is filed at Sacramento the Sharkey bill which requires compulsory regulation of production will be inoperative until voted upon at the next general election in November, 1932.

OKLAHOMA FIELDS

(Continued from Page 34)

at 2,505-2,600 feet. The operators will seek another oil producing sand at the 2,700-foot level, as the shallow sands are not considered commercially profitable.

Cox & Hamon's No. 1 Ratliff-Spears, NW cor. SW, Section 19-1s-2w, is a new location offsetting the Carter Oil Co.'s No. 2 Robb, in the Tatums Pool, which was recently completed for 1,210 bbls. of oil a day. Frank Gouin's No. 1 M. E. Burton, C S half SW, Section 30-1s-2w, is also a location.

Other Southern Tests

Other tests drilling in the southern part of the State include the counties of Marshall, Love, Jefferson, Garvin and Grady. Ross & Conover's No. 1 Taliaferro, SW cor. NE NW, Section 34-5s-5, a wildcat test south of the Madill Field, was drilling at 420 feet. The 12-inch casing was landed at 242 feet.

In Love County, Batson, Starritt & Autry's No. 2 Autry, SE cor. NE, Section 27-6s-2, a wildcat test northeast of Marietta, was coring at a total depth of 970 feet, where a showing of oil and gas was found. The test is expected to be drilled to a total depth of 2,400 feet.

The Monarch Petroleum Corp.'s No. 1 Gregg, SW cor., Section 36-3s-4w, Jefferson County, about a mile west of the Healdton Field, was drilling at 3,765 feet.

In Garvin County, the Malernee Oil Co.'s No. 1 Wacker, NE cor. SW, Section 24-2s-2w, a wildcat several miles from the nearest production, was drilling at 4,750 feet.

Operations in Stephens County in the southern part of the State were as follows: K. D. Drilling Co. and others' No. 1 Hightower, SW cor. SE NE, Section 15-3s-5w, was fishing at 785 feet. Paul Turner and others' No. 1 W. M. Andrews, NW cor. SW SW, Section 5-2s-7w, a wildcat test was shut down at 2,900 feet. Crane and Rankins' No. 1 Adkins, NE cor. SE, Section 14-1-9w, a wildcat is still shut down in red lime at 3,265 feet.

In Grady County, Watchorn Petroleum Co.'s No. 1 in the SW cor., Section 12-4-8w, is preparing to drill deeper from the old total depth of 2,950 feet.

Greater Seminole Operations

The Pure Oil Co. is expected to abandon its semiwildcat test near the St. Louis Pool in Pottawatomie County unless shallow production is found after ripping the casing. The test is No. 1 Ashby, SE cor. NE Section 22-7-5, and it was bailing at 1,700 feet to test a shallow sand at that depth. The total depth of the test was 4,312 feet, where a hole full of water was found. It was plugged back to the upper formations because a showing of oil was found while the test was drilling.

The Prairie Oil & Gas Co.'s No. 1 Sager, SE cor. SW Section 8-9-6, the second producer in the new area north of the East Earlsboro Pool, Seminole County, swabbed 155 bbls. of oil in nine hours on a recent gauge. The total depth of the well is 4,245 feet in Wilcox sand.

In the Carr City Pool, the Amerada Petroleum Corp.'s No. 1 L. Tiger, NE cor. NW SE Section 3-8-5, was shot with 15 quarts and swabbed 95 bbls. of oil while cleaning out from the Wilcox sand at 4,195-4,210 feet. The same company's No. 2 L. Tiger swabbed 305 bbls. of oil a day from the Wilcox sand at a total depth of 4,211 feet. It was put on the gas lift and made 3,065 bbls. of oil in 24 hours.

In Pontotoc County operations are continuing at a steady rate. Lynch and others' No. 1 Newby, SE cor. NE NE Section 24-5-5, on the edge of the Beebe Field, pumped 42 bbls. of water and 5 bbls. of oil from sand at 2,374-2,414 feet. It was drilling deeper at a total depth of 2,479 feet, with approximately 1,800 feet of oil in the hole.

C. E. Edwards and others' No. 1 Dyer, SW cor. NW SE Section 8-4-7, was swabbing 75 bbls. of oil a day from sand at 1,060-65 feet.

Stanolind Oil & Gas Co.'s No. 1 Burke, NE cor. SE Section 32-5-5, was expected to reach the pay horizon in a few days. It was drilling at 2,050 feet. Same company's No. 2 Roberts, NE cor. SW NE Section 32-5-5, was drilling at 1,250 feet.

There has been considerable acreage put on record in Grady County during the last few weeks in scattered parts of the county. The principal townships that have been active are 6-8w, 6-7w, 6-5w, 8-5w, 9-5w, 6-6w, 9-6w, 7-7w, 8-7w, 7-8w and 8-8w. The acreage is believed to be on long-term contracts that do not specify drilling.

Some activity in leasing of scattered lands in Cleveland County was under way during the last few weeks. It is the first interest in the leasing of acreage that has taken place in the State for some time.

Greater Seminole Production

The production from the Greater Seminole area for the week ending July 3, was approximately 180,490 bbls. The first 12 pools listed below comprise the Seminole area which averaged 130,223 bbls.

Pool—	Bbls.
Little River	24,155
East Little River	5,065
Carr City	13,910
Maud	2,210
Mission	8,905
Bowlegs	14,860
Earlsboro	17,830
South Earlsboro	4,650
East Earlsboro	18,310
Seminole	14,430
East Seminole	1,510
Searight	4,388
Total	130,223
Allen	11,142
Asher	631
Wanette	5,931
Konawa	9,010
Sasakwa	2,050
St. Louis-Pearson	22,130
Grand total	180,490

Oklahoma City Shipments

The total shipments from the Oklahoma City Field for the week ending July 3, were 1,161,586 bbls. including the tank car shipments. The shipments by companies were as follows:

Company—	Bbls.
Champlin	74,668
Continental	56,690
Empire	219,317
Magnolia	8,801
Oklahoma	60.513
Operators	42,473
Prairie	5,859
Shell	70,345
Sinclair	276,798
Stanolind	283,679
Tidal	4,562
T. I. O.	44,601
Petroleum P. L.	2,771
Wilcox	5,647
Century	4,871
Total	1,161,596

The daily production and pipe line shipments from the Oklahoma City Field for the week ending July 3, were as follows:

Date—	Prod.	Wells	Shipments
June 28	140,726	105	192,785
June 29	154,097	141	185,898
June 30	177,175	155	211,878
July 1	144,574	130	170,751
July 2	326,879	129	192,617
July 3	325,491	135	207,707

Atoka County

S. Moyen and others' No. 1 Miller, SW cor. NE NW, Section 26-1-14, has been abandoned at 433 feet.

Coal County

L. E. Stewart and others' No. 1 M. Howard, NW cor. SE NW, Section 6-4s-11, has drilled to 1,300 feet and is underreaming 6-inch pipe.

Creek County

Marbles and others made location for No. 1 Evans, NW cor. SW, Section 29-19-8. Hollifield and others' No. 1-A R. Johns, SE cor. SW SE, Section 4-17-10, is a location. Holmes and others' No. 2 Bruner, SE cor. NW SW, Section 3-19-9, is dry and abandoned at 2,750 feet. H. U. Bartlett and others' No. 1-A Coonrod, SW cor., Section 8-19-9, made 10 bbls. from sand 2,179-2,221 feet.

Haskell County

Holden & Ault's No. 1 J. Ellis, CWL NW NE, Section 1-9-18, is dry and abandoned at 990 feet.

Jefferson County

C. D. Chenault's No. 1 Graver, SE cor. NE, Section 15-7s-6w, has been abandoned at 1,824 feet.

Lincoln County

T. B. Slick estate's No. 3 fee, SE cor. NE SW, Section 7-14-4, made 4,800 bbls. from sand 5,009-26 feet.

Muskogee County

H. L. Jolly's No. 2 Spaulding, NE cor. SE SE NE, Section 8-15-18, is drilling deeper at 1,470 feet. H. E. Dowd and others' No. 1 Brown, C NW NW, Section 26-10-19, is drilling at 160 feet. Taylor & Geiger, CEL NW NE, Section 16-15-15, made 1,500,000 feet of gas from sand 760-852 feet. Roy Reed and others' No. 1 M. Stidham, NE cor. NW NE SE, Section 8-15-18, has been completed for 5,500,000 feet of gas in sand 1,570-75 feet. C. F. Finefield and others' No. 2 L. Fields, SW cor. NE SE NW, Section 9-15-18, has been abandoned at 931 feet.

Love County

Batson, Starritt and Autry's No. 1 Cross, NE cor. NW NE, Section 27-6s-2, is drilling at 500 feet.

Oklahoma County

American Oil & Refining Co.'s No. 1 Washington, SW cor. NW SW, Section 35-12-3w, made 7,701 bbls. in four hours from Wilcox sand topped at 6,240 feet, total depth 6,357 feet. Champlin Oil & Refining Co. and Hall & Briscoe's No. 1 Central, NE cor. SW SE SE, Section 3-11-3w, made 2,288 bbls. in nine hours from Wilcox sand 6,269-6,310 feet, total depth 6,450 feet. Same parties' No. 2 Central, NE cor. SW SE, Section 3-11-3w, flowed 5,482 bbls. in 6⅓ hours from Wilcox sand 6,288-6.370 feet, total depth 6.374 feet. R. A. McArthur and others' No. 1 Kammerdiener, SW cor. NE NW, Section 3-11-3w, made 8,114 bbls. in five hours from Wilcox sand 6.355 feet, total depth 6,500 feet. Phillips Petroleum Co.'s No. 2 Hyland, SW cor. NE, Section 10-11-3w, made 11,984 bbls. in eight hours from Wilcox sand topped at 6,303 feet, total depth 6,463 feet.

Okmulgee County

McDonald and others' No. 2 E. Tiger, NE cor. SE SE, Section 24-16-13, made 1,500,000 feet of gas in sand 1,630-50 feet. Eagle Picher Lead & Zinc Co.'s No. 1 Mitchell, SE cor. SW SE, Section 27-12-12, is dry and abandoned at 3,383 feet.

Pawnee County

Peter Adamson, Jr.'s No. 2 Moore, CEL SE SW, Section 24-21-7, is dry and abandoned at 1,175 feet.

Pittsburg County

Utilities Production Co.'s No. 3 F. Vail, NW cor. SE SE, Section 8-7-18, has been completed for 9,250,000 feet of gas in sand 1,806-2,139 feet.

Seminole County

Droppleman and others' No. 1-A Lack, SW cor. SE NW, Section 30-8-8, Wewoka Pool, made 100 bbls. at 3,765 feet after plugging back from 3,985 feet in Wilcox sand.

Tulsa County

Gypsy Oil Co.'s No. 10 Hardridge, SW cor. NW SW, Section 36-18-12, is rigging up to deepen.

BUREAU OF MINES STATISTICS FOR MAY, 1931

(Continued from Page 46)

amounted to 47,948,000 bbls. which, though a decline from the April stocks of 639,000 bbls., was larger than expected due to the material gain in output. The May stocks represent 37 days' supply as compared with 39 days' supply on hand a month ago and with 40 days' supply on hand a year ago.

The refinery data of this report were compiled from schedules of 356 refineries, with an aggregate daily recorded crude oil capacity of 3,784,490 bbls., covering, as far as the bureau is able to determine, all operations during May, 1931. These refineries operated during May at 67 per cent of their recorded capacity, given above, as compared with 349 refineries operating at 67 per cent of their capacity in April.

DOMESTIC EXPORTS OF PETROLEUM AND REFINED PRODUCTS

	—Month of May—		Five mos. ending May	
	1930	1931	1930	1931
Crude petroleum, bbls.	2,202,513	2,267,666	9,584,782	9,308,274
$	3,128,294	1,871,386	12,729,777	8,884,071
Total refined petroleum, bbls.	8,736,969	8,965,438	52,239,962	39,665,493
$	34,516,730	23,496,601	195,897,738	109,603,288
Gasoline, naphtha, other light prod., bbls.	4,920,281	4,792,073	26,548,947	19,828,587
$	20,207,634	12,539,634	111,500,631	55,701,495
Illuminating oils, bbls.	815,799	1,144,874	7,209,951	5,298,761
$	3,542,244	3,329,456	28,600,706	15,739,768
Gas and fuel oils, bbls.	2,138,341	2,287,046	14,133,942	11,296,686
$	2,193,932	2,165,772	14,231,631	10,590,475
Lubricating oils, bbls.	849,998	732,393	4,277,290	3,198,515
$	8,411,757	5,353,745	40,567,587	27,029,461
Other refined petroleum, bbls.	12,550	9,052	69,832	42,944
$	161,163	107,994	996,883	542,089
Paraffin wax, lbs.	21,557,932	17,584,272	112,913,442	114,982,846
$	801,594	512,885	4,434,405	3,535,809

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SALT WATER DISPOSAL WILL BE ONE OF EAST TEXAS' PROBLEMS

By Neil Williams

HOUSTON, Tex., July 6.—The inevitable intrusion of salt water which already has begun in the East Texas Field may be looked upon by the industry at large solely as a hazard to the production of oil but to the actual operators in the field it presents another problem—that of disposal of the water produced. Although the water situation in the field so far has not reached extensive proportions, the majority of operators already has recognised the fact that provision must be made at once for handling water production of the field and they already have taken steps to work out a feasible system.

That disposition of water in East Texas will be a greater problem than that experienced in any other field is realized by most of the producers, who, through a specially chosen committee, for some time have been making a survey of conditions. Removal of oil field water always has been a serious problem in Texas in view of drastic state laws pertaining to the contamination of fresh waters. Various methods and systems of disposing of water in other fields have been worked out and have been operated successfully in those fields according to local requirements, but the East Texas Field is of such a nature and of such large scope that systems as adopted in other fields either would be impossible or inadequate except on an almost prohibitive scale.

Salt water disposal systems can be divided into four main classes, although there may be various deviations or combinations in different fields to meet local conditions. These groups are: Disposal by evaporation and seepage, direct run-off into streams and the sea, storage during periods of dry weather with run-off into streams during flood or high water periods, and cavity wells.

In Arid Districts

Evaporation and seepage methods can be practiced only in more or less arid districts, or those fields where rainfall is less than evaporation, and where the amount of salt water production is not too great as these methods require long periods of time for disposal and large storage reserves. East Texas has a relatively high percentage of rainfall, along with the Gulf Coast, and thus evaporation and seepage could not be depended upon, neither could sufficient reservoirs be provided to handle the production of water expected.

Cavity wells can be provided only in those districts where there are more or less porous and broken formations not linked with the oil-producing horisons. Disposition of water through cavity wells is practiced in numerous coastal fields where salt dome cap rock many times possesses large cavities, and also in some West Texas fields. East Texas formations are not adapted to this method.

Direct Run-Off Hazardous

Direct run-off into streams and the sea is feasible only when the salt water production is not so great but that the volume of water flow in the streams or rivers is sufficient to handle the salt water and dilute it to a point which will not prove injurious to vegetation, livestock or fish, or cause damage to users of the stream water. This method is extremely hazardous to operators in view of possible serious damage suits. Even fields in close proximity to salt water streams and the sea find this method inadequate at times in view of the fact that field salt water usually is around four times as salty as sea water and is sufficient to result in injury to sea life adjacent to shore if not diluted.

The combination storage and run-off system was devised to meet conditions of fields whereby streams and bodies of water into which the salt water must be run are inadequate only at certain periods to handle the salt water. During periods of low water or when the water is being used for some purpose such as irrigation, the production of salt water is too great to be handled by the streams or other bodies of water. During these periods the salt water must be impounded in large reservoirs until the streams are in high water stage and have sufficient volume of flow to take care of the salt water.

As previously mentioned disposal by cavity wells or evaporation and seepage are not possible in East Texas. At the same time the field is so large that the present rivers and water shed draining the district do not begin to have sufficient volume of flow to handle the expected enormous daily salt water production by the direct run-off system. Even if the water drainage during flood periods were sufficient to handle the salt water production, the provision of adequate storage facilities and reservoirs for low water seasons would prove a staggering undertaking.

Tremendous Volume Threatened

The amount of salt water to be produced by East Texas will run approximately 1,500,000 bbls. daily probably by the end of the third year or in the fourth year of the field's life, according to conservative estimates which have been made. This estimate has been based on information obtained in a survey of conditions in other fields of Texas, particularly in reference to Powell, Mexia and other Woodbine fields of East Central Texas.

The estimates for East Texas have been arrived at in the following manner: Taking Powell, for instance, the survey revealed that that field reached its peak salt water production at the end of its third year when it was making 300,000 bbls. daily along with 45,000 bbls. of oil. At the end of the third year Powell was estimated to have produced 70 per cent of its total recovery of oil. The total recovery has been figured to be around 110,000,000 bbls., so at the end of the third year, 77,000,000 bbls. had been depleted, leaving 33,000,000 bbls. to be recovered.

East Texas' Big Potential

In East Texas the total recovery is estimated to be at least 1,500,000,000 bbls., and if the peak water production is reached at the end of the third year, and 70 per cent of the oil is depleted the same as at Powell, there will remain roughly 450,000,000 bbls. in the ground. Everything being equal, the daily production of East Texas at the end of its third year will hold the same ratio to 450,000,000 bbls. of oil (that which remains in the ground) as the 45,000 bbls. daily production at Powell held to 33,000,000 bbls., the amount of oil remaining at Powell at the end of that field's third year. This figures out 613,636 bbls. daily. Taking into consideration that Powell's recovery per acre is approximately 42,000 bbls. as against an estimated average of 15,000 bbls. for East Texas, or 2.6 times greater, the daily production for the latter field at the end of its third year would be 236,014 bbls. daily. The salt water production, everything being equal, would hold the same ratio to 236,014 bbls. as the 300 000 bbls. at Powell held to 45,000 bbls., that field's oil production, which would be 1,573,420 bbls.

No Conservation in Powell

These estimates cannot be taken as an actual gauge of what is to occur in East Texas because of the numerous differences in the two fields. In this computation no allowance has been made for the fact that East Texas may not be fully developed at the end of three years as Powell was, nor for the fact that Powell was drilled about three wells to 10 acres as against possibly one in East Texas. The drainage at Powell, because of this and because of the absence of any proration restriction of any kind, was very rapid, bringing on its peak production, and consequent greater water encroachment, more quickly. On the other hand, it is impossible to forecast what conditions will be in East Texas. If conservative development and operation is practiced from now on under proration, the water may be held back and the field enabled to recover a greater percentage of oil in the long run. If this is done the peak water production probably will come much later than at Powell, possibly not until late in the fourth year or even the fifth year.

However, no matter when it comes, it can be stated fairly safely that the peak water production of East Texas will reach at least 1,500,000 bbls. daily, possibly more, and that operators now need to prepare for handling that volume.

In connection with the salt water survey of various fields of Texas which were used as a basis for figuring what might result in East Texas some interesting statistics were compiled showing recoveries of oil. In tabular form these figures for three Woodbine fields follow:

	Barrels		Per cent				
Field—	Recovery per acre	Total recovery	Recovery second year	Recovery third year	Recovery fourth year	Recovery fifth year	Life field (years)
Powell	42,000	110,000,000	48	70	82	92	5
Wortham	31,000	23,000,000	83	93	96	..	4
Mexia	25,000	94,000,000	47	69	80	..	6

A Serious Problem

Disposition of 1,500,000 to 2,000,000 bbls. of salt water daily naturally constitutes a problem due great consideration. As cavity wells cannot be provided for such volume and reservoirs for evaporation and seepage are out of the question, removal of the water will have to be by some run-off system. The water shed for East Texas is 70 per cent into the Neches River, 20 per cent into the Sabine River and 10 per cent into streams feeding into Caddo Lake of northeast Texas and northwest Louisiana. Although both the Neches and the Sabine are major rivers, emptying directly into Sabine Lake, a large salt water body, an inlet from the Gulf of Mexico, seven times their combined volume of flow at low water periods would be required to absorb the salt water production expected from the East Texas Field.

Solidity Unusually High

The solidity of East Texas salt water makes it more difficult of disposal as this solidity, which is 4 per cent, is higher than average. State laws require that field salt water run off into streams must be reduced to a maximum of 10 grains per gallon. For comparison of salt water content, water at Mexia runs 2,321 grains; Powell, 673 grains, while East Texas water is 3,500 grains.

Danger to Water Systems

The Sabine and Neches Rivers furnish irrigation water for more than 120,000 acres of rice lands in the Beaumont and Port Arthur district which make the use of these rivers for dumping of East Texas salt water especially hazardous. In addition, Beaumont, Port Arthur and large refineries at those cities, as well as a number of smaller communities and cities, utilize the Sabine and Neches for water supply. Thus if these rivers are used for carrying off the salt water, extreme care must be used by operators.

Impounding of the water during low water stages of those rivers and running off the salt water in periods of high water has been considered but the volume of water in high water is an uncertain factor and it is doubtful that even then the volume at high water would be great enough to meet emergencies. In addition it would be an expensive undertaking to provide reservoirs of sufficient capacity.

May Excavate Drainage Ditch

The suggestion of excavating a large drainage ditch the full distance from East Texas to the Gulf of Mexico has been looked upon with most favor. Considering the volume of salt water, the canal necessarily would have to be the equivalent of a fairly large-sized river and its excavation would be a good sized project but under the present conditions and outlook this undertaking is regarded as the most satisfactory and most free of possible complications.

Estimates on what such a project would cost have been placed at approximately $15,000,000." This seems a staggering amount of money to expend for East Texas, and, in view of the already large amount of money sunk in development and operation of the field with a comparatively small amount of return so far, it possibly is just another argument in favor of proration—a proration which will conserve the natural resources, retard the encroachment of water, increase the ultimate recovery, and, indirectly, enable the producers to receive as much financial return as possible for their investment.

OIL SHOW NEAR VIENNA

A small show of oil was found recently at Kierling, a few miles from Vienna. Oil was also struck at Zisterdorf.

TO CONTINUE RESEARCH ON THREE OIL PROJECTS

Plans for continuation for two years, but on a smaller scale, of the five-year program in fundamental research in petroleum which ended July 1 last, have been announced by the American Petroleum Institute.

The sum of $75,000, already largely subscribed by several oil companies, will make possible further studies of petroleum occurrence, recovery and composition through Projects Nos. 4, 37 and 6. Some $115,000 already has been invested in these three projects out of the $100,000 contributed annually during the past five years by John D. Rockefeller and the Universal Oil Products Co. At the end of the two years it is hoped to raise funds sufficient to finance a resumption of the complete program.

Project No. 4, "Origin and Environment of Source Sediments of Petroleum," has as its object ascertaining the characteristics of source beds of petroleum. The first phase of the investigation, covering a study of the conditions under which source sediments are now accumulating beneath the sea, has been completed after five years of work by Dr. Parker D. Trask. The second phase, investigation of possible sources of material in petroleum rocks of past geologic age in the vicinity of present production fields, now will be undertaken.

Project No. 37, "Fundamentals of the Retention of Oil by Sand," represents a search for information as to the physical properties of oil-gas mixtures under pressures as high as 3,000 pounds, information necessary to planning a scientific development program. This work has been under way for about three years under the direction of Dr. Robert A. Millikan, of the California Institute of Technology.

Project No. 6, "The Separation, Identification, and Determination of the Constituents of Petroleum," deals with the composition of petroleum, present information being woefully inadequate. The work is being done under the direction of Dr. E. W. Washburn, of the United States Bureau of Standards, who has developed technique and much expensive apparatus, is conducting operations at the bureau on a 24-hour basis and rapidly is producing results.

CARIBOO OIL RESERVE

The British Columbia provincial government has established a reserve for oil and gas covering the Cariboo district in the northeast of the province, where many oil leases have been taken as a result of the showings in a well being drilled by Vancouver interests near Australian, a small railroad station near the Fraser River.

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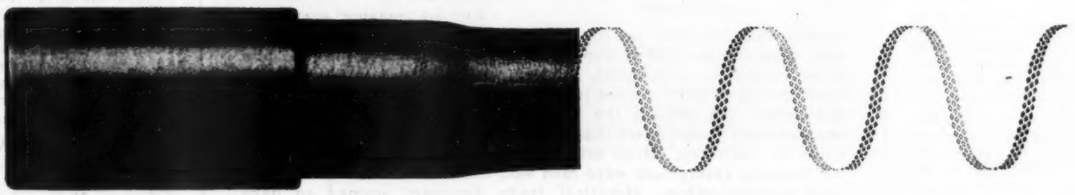

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Left Life of Adventure to Enter Oil

John Borden, Head of Old Dutch Interests, Was Arctic Explorer, Submarine Chaser, Whaler, Hunter and Polo Enthusiast

By Thomas F. Smiley

One cannot help wondering if business life—even the oil business and its daily tilt with chance—must not seem pretty dull at times to a man whose earlier years were a succession of big-game hunting, Arctic exploration, submarine chasing, whaling, shipwreck and perilous whatnot. John Borden, chairman of the board of the Old Dutch Refining Co. and president and chairman of the board of the Old Dutch Oil & Gas Co., provides the case in point. And when you stop to think it strikes you as a bit queer that he ever turned to commercial pursuits at all when it is so evident that he loved adventure and that he had the financial resources necessary to satisfy this liking to the utmost.

The chief difficulty in writing about Mr. Borden lies in his notion that a hairbreadth escape or two from death is nothing to get excited over, so why talk about it? One line thrown out while gathering facts concerning his life brought this from John P. Brady, a newspaper friend in Chicago:

"Anyone who knows John Borden well can readily understand what a difficult job it is to draw anything but the barest biographical data out of him. To us newspaper men in Chicago who know him intimately his lack of assumption, his innate modesty and his naturalness are almost a miracle."

Mr. Borden was born in 1884 in what is still one of the show places of Chicago's Gold Coast. Both his father and his grandfather were wealthy and there was no pecuniary reason for young John not leading the life of a playboy if he chose. His father, William Borden, and his grandfather, John Borden, with Marshall Field and Levi Leiter, made about $1,000,000 each in the Leadville, Colo., mining boom of the seventies.

Mr. Borden's mother was an earnest supporter of the evangelistic work of Dwight L. Moody and Ira D. Sankey and she taught a Sunday school class in the Moody Bible Institute. Among her pupils was Walter Howey, who became managing editor of the Chicago Herald-Examiner and later of the New York Mirror. Mr. Howey tells how she sought to lead him into foreign missonary work, as she did her own son William Borden, who gave his life for the cause of Christianity in Arabia.

Phi Beta Kappa Man

At the age of 22 John Borden graduated with honors from Yale, where he was elected to Phi Beta Kappa as a result of his scholastic standing and served as president of the chapter. He was captain of the Yale Gun Club. Two years at Northwestern Law School followed and young Borden was admitted to the Illinois bar in the same year, 1908.

Plans for a legal career were sidetracked at this juncture by a situation which the young lawyer, Walden W. Shaw and John Hertz diagnosed as an opportunity to make some money. Taxicabs just then were coming into popularity and the three decided they might as well be the ones to provide Chicago with this newest method of darting about the streets, so they organized the group of Yellow Cab companies the success of which was prodigious and immediate. In 1920 Mr. Borden sold his interests at a profit of several million dollars.

The first of a series of Arctic voyages came in 1913, when Mr. Borden built at his own expense the auxiliary schooner yacht "Adventuress" and financed an expedition to Alaska and Bering Sea. The primary purpose was to study and get speciments of Arctic wild life for the American Museum of Natural History in New York. Roy Chapman Andrews went on this trip, representing the museum, and Charlie Sparks, an old whaling captain of New Bedford, Mass. was in command. Among results of the expedition were the first motion pictures of fur seals on the Pribilof Islands.

The "Adventuress" carried a 30-foot whaleboat and one day in September Captain Sparks, John Borden and four members of the crew chased a humpback whale some 5 miles off the coast of Kodiak Island. Captain Sparks had the steering oar and John took his position in the bow with a harpoon.

This Whale Knew a Trick or Two

After about two hours' work the boat was maneuvered so that it was right alongside the humpback, which was fully 60 feet long. Steadying himself in the boat, John, who never had handled a harpoon before, was poising the iron to throw it when the whale gave its tail a flirt which capsized the boat and tossed its six occupants into the icy water of Shellikoff Straits. None of the sailors could swim, but all manager to hang onto the wrecked whaleboat till they were picked up an hour later by the schooner.

When it became apparent in 1915 there was only slight prospect of the United States getting into the World War, the young adventurer volunteered for service as an ambulance driver with the French army near Dunkirk. He and his sister, Miss Mary Borden, who later was to win a name as a novelist, gave the French Red Cross a field hospital at La Pans, Belgium, and Miss Borden conducted this hospital throughout the rest of the war.

With the sinking of the "Lusitania" Mr. Borden hurried back to the United States, supposing that this would be the signal for America's entrance into the conflict. Disappointed in this expectation, Mr. Borden in 1916 formed with Captain Louis Lane a partnership styled Borden & Lane, to engage in Arctic whaling and trading. Mr. Borden put up the money to build and equip the "Great Bear," a three-masted auxiliary schooner of about 400 tons. Early in July the ship, with Captain Lane as master, Mr. Borden as first mate and Hullin S. Mott as second mate, sailed from Seattle, Wash., for Herschel Island and the Arctic Coast of Canada. The expedition was made up largely of University of Washington and Seattle High School students and sportsmen friends of Mate Borden.

Like Stories You Read in Boyhood

The boat was in Bering Sea when word reached her that two sailors had been shipwrecked on St. Matthew Island. The "Great Bear" forthwith changed her course and headed for St. Matthew.

> Half speed ahead, by guess and lead
> For the sun was mostly veiled,
> By luck and lock, from fog to fog,
> Sailed we as Bering sailed.

And like Vitus Bering, the Danish navigator, the Borden-Lane voyagers were shipwrecked. It was just before midnight on August 9, with a thick fog but only a moderate sea. Mate Borden was in the galley drinking a cup of coffee preparatory to going on deck to relieve the second mate on watch when without warning the ship crashed against what later proved to be Pinnacle Rock, an island a half mile long but only about 200 feet wide. Before the vessel sank all got away on a launch and four whaleboats and at daybreak they rowed to St. Matthew Island, where they lived for 15 days until rescued by the revenue cutter McCullough, sent out to look for them. They saw nothing of the sailors whom they had started out to find.

While the castaways were on the island, wondering if they would have to spend the winter there, Mr. Borden had one of those adventures which you have to find out about from others. The direction of the wind had changed suddenly and it was coming in howling gusts from the sea. The launch lay at anchor an eighth of a mile from shore. Pitched about by the hurricane, the craft was in danger of being swamped.

Wotta Life!

"Come on, boys," Mate Borden called as he buttoned up his coat and ran to one of the whaleboats on the beach. Second mate Mott and several others followed and they rowed through the turbulent seas to within a stone's throw of the endangered launch. It had been the intention to cut the launch loose from her anchor and let her drift ashore, but now it was evident that if the plunging boats were brought together they would smash each other.

"Here goes," yelled the Chicago sportsman as he stepped on the gunwale of the whaleboat and without any dramatics dropped into the chilling water. Mott and the others watched in alarm as their leader swam through the buffeting waves to the launch's anchor rope. There he drew a knife from his belt and slashed the rope in two. The launch poised on the crest of a huge swell for a moment and then dived shoreward, leaving the swimmer in the churning water. The whaleboat, now a plaything of the growing tempest, was unable to go to his aid, and in spite of the efforts of its oarsmen it was driven back toward the beach.

The imperiled swimmer sized up the situation and struck out for shore. Now with his dripping head outlined against the sky at the crest of a wave, now lost to view in the trough, the first mate of the "Great Bear," weighted down by his heaving clothing, fought his way with powerful strokes. The watching men in the whaleboat expected to see him overcome by the cold water and sink to death. He reached the beach surf only to be drawn back by the undertow. The second mate and his companions tried futilely to effect a rescue. Phil Weiss, University of Washington student, tried to swim out with a lifebelt, only to be seized by the surf and flung back to land. Eventually the man in the water struggled to a point where he could be caught by

GOOD OLD RULES DON'T ALWAYS WORK

Prior to 1927 John Borden's knowledge of the oil business was largely academic. Today he is among the important operators in Michigan, both as a producer and as a refiner. In 1919, although city-bred, he transformed a run-down plantation into the South's model farm. Still earlier, when his total knowledge of motor transportation was what any young man acquires through driving his own car, he organized the biggest taxicab business the world had seen and made a fortune out of it.

John Borden

Which indicates how long-accepted notions have a way of being knocked into a cocked hat or of getting cluttered up with exceptions. The man of 50 recalls the old formula for laying sure foundations of success: "Learn a trade, whether you mean to follow it or not. Then, if adversity comes, you will have it to fall back on." And there was its sister rule: "Know your business from the ground up."

But an amazing era of invention and discovery set in. Methods which once had spelled success were scrapped. Men who could not fit themselves into the new order looked on bewildered. Perhaps in youth they had learned a trade, but now when needed it was not there to "fall back on." The automobile had effaced the jobs of horseshoer, wheelwright and harnessmaker; machinery had supplanted thousands of different kinds of craftsmen. More astounding, the directing heads of many big business enterprises were men who had served none of the old-time apprenticeships. Heretical trade doctrines seemed to have crowded out the tried and true ones. Things were topsy-turvy.

The fact is, however, men who "know the business from the ground up" are just as indispensable as ever, but in some cases their place in the economic scheme has shifted. They have become specialists in this department or that. Over all presides some man whose peculiar genius is management and co-ordination. Maybe he grew up in the business. Maybe he didn't. But in either event he is an organizer, has the modern outlook, drives directly to the core of a situation and is master of certain broad principles that apply to all commercial undertakings from the roadside pop-stand to the billion-dollar corporation.

the men in the whaleboat and dragged ashore.

"Tough life," observed the second mate when the two had gained dry land.

"Yep, pretty tough," conceded the first mate through chattering teeth.

In the Fight at Last

Returning to Chicago, Mr. Borden was convinced the United States could not keep out of the war much longer. He bought the steam yatch "Kanawha," which had the name of being the fastest craft of its kind in the country, and with the aid of a naval architect he had her conditioned for war service. A few weeks after war had been declared she was ready to start on her career as a submarine chaser. Her named was changed to "Piqua." Mr. Borden was made a lieutenant commander U.S.N.R.F. and arrived with his boat at Brest, France, July 4, 1917. The crew had its first experience on the way from New York to Brest when a submarine was reported in sight. Commander Borden sounded "general quarters" and rang up "full speed ahead." He heard one of the sailors shout, "Break out Old Glory and show 'em who we are!" Every man was on his toes. Before they got within range they discovered the submarine was a dead whale.

For 18 months after its arrival in French waters the "Piqua" did excellent service pursuing subs in the English Channel, Bay of Biscay and the North Sea. Five days at sea and three in port was the regimen for the rest of the war. Grover Alexander, the National League pitcher, who served on a sub chaser, called it a one-armed existence because it usually was necessary to use one hand in hanging on. In six months time Mr. Borden was in command of the boat without any Annapolis assistance, and toward the end of the war he was in command of a flotilla, with the rank of lieutenant commander. He and Lieutanant Commander Porter were the only reserve officers placed in command of fighting ships during the war. Although Mr. Borden had no naval training other than that obtained on his own boats, he had a master's license for steam vessels of any tonnage on any ocean.

South's Finest Model Farm

A year and a half of sub chasing left the "Piqua" much the worse for wear and her owner had to leave the boat on the other side at the end of the war. Returning to the United States in 1919, Mr. Borden went on a quail hunting expedition to Grenada, Miss., where he and his father had been accustomed to go when John was a boy. He became interested in an old plantation which was going to ruin. He bought it, along with several thousand acres of adjoining land, which he added to the estate. In a year's time Glenwild Plantation had become one of the sights of the central South. The late Charles P. Mooney, editor of the Memphis, Commercial Appeal, described it as the finest model farm the South ever saw.

Mr. Borden was made president of the Central Mississippi Fair Association for several years and as a feature of the annual exhibitions he twice put on big polo tournaments, bringing teams from Chicago for the games. He had one of the finest strings of ponies in the country at that time and the team of which he was captain won the Midwest championship in 1923.

All quite worthy and interesting, but again the North called. In 1925 Mr. Borden had married Miss Courtney Letts, of Washington, D. C., and as she loved outdoor adventure as ardently as her husband, she heard the call as clearly as he. And so it came about that the two started April 21, 1927, with a few friends and a carefully picked crew, on an expedition to Wrangel Island and the Arctic Coast of Siberia for the Field Museum of Natural History. They hunted the polar bear, the Alaskan brown bear and the walrus and had plenty of the excitement that goes with big game hunting. The boat, the "Northern Light," was specially built and equipped by Mr. Borden, who was its captain. The story of the voyage is told in a delightful volume, "The Cruise of the Northern Light," written by Mrs. Borden herself.

Back in the United States once more, Mr. Borden soon was interested in the oil industry and he became identified with the Old Dutch Refining Co., which has a modern refining plant in Muskegon, Mich., and the Old Dutch Oil & Gas Co. (at first styled Gibson, Johnson & Borden, Inc.), which has been conducting drilling and leasing operations throughout Michigan, especially in the Mount Pleasant area. The refinery, the largest independent refinery in Michigan and costing $450,000, began operations late in 1929. It receives a daily average of about 1,400 bbls. of oil from the Mount Pleasant area, part of this being purchased from other producers. About 1,000 daily is run from the Muskegon Field, so that the refinery is running about 2,400 bbls. of crude daily.

Mr. Borden is a member of the Arctic Brotherhood, the Chicago Club of Chicago and the Pacific Union Club of San Francisco. He also is a member of the Delta Kappa Epsilon college fraternity. He divides his time between Chicago, where he maintains his residence, and Michigan, where he devotes close attention to his oil interests.

METHODS OF USING COMPRESSED AIR IN PIPE LINE CONSTRUCTION

By L. G. E. Bignell
Petroleum Engineering Editor

Compressed air has been used for many things in the building of pipe lines, especially for drilling holes for blasting rock along the right of way or in ditches. Where portable compressors were available air has been used for many other purposes but with the water cooled type mounted upon trucks or trailers it has been difficult at times to haul this type of compressor over rough places.

With the development of the Davey portable compressors that are mounted upon caterpillar tractors it is now possible to have compressed air at pressures of about 125 pounds per square inch and at a volume of 142 cubic feet per minute in practically any place along the right of way.

This new type of compressor is mounted on the end of the tractor and power is secured from the tractor engine and transmitted by V-belts. The compressor is air cooled with finned aluminum alloy cylinder heads and manifold reducing the number of parts and in this way holding the weight of the machine down to about 1,000 pounds. Being air cooled the problem of securing an adequate supply of water is eliminated.

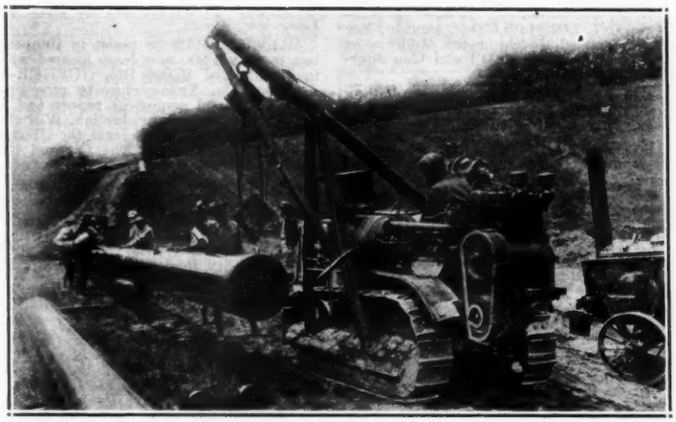
The accompanying pictures illustrate the compressor and show how it is mounted upon the tractor and some of its many uses. They were taken along right of way of the Panhandle Illinois Pipe Co. in Illinois where a gas line is being laid by Williams Brothers, Tulsa. This is part of the system originating in the Panhandle of Texas and running to Chicago and points in Indiana and Ohio.

One of the pictures shows how lengths of painted pipe are handled and strung along the right of way and made ready for couplings. The air winch mounted on the tractor operates the crane that holds the pipe and judging from the lengths of 22-inch pipe being handled it has a good capacity.

The other two pictures show two methods of turning the pipe while the hot coat of enamel is being applied. In one view the pipe rests upon air driven rollers and the movement of the pipe is controlled by the tractor driver. The other picture shows how the pipe is suspended at one end and handled by the air winch and crane while the hot coat of protective coating is applied.

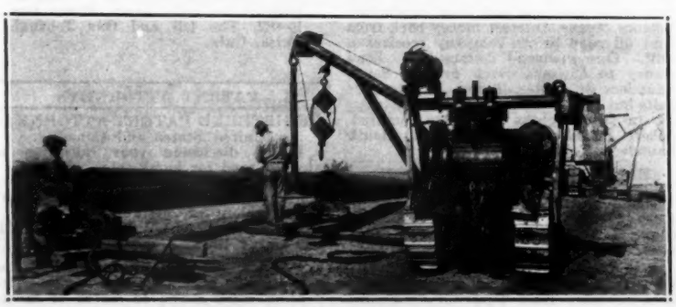
After the pipe has been connected up into runs and the ditch dug the same portable outfit is used in lowering the pipe into the ground. Air is also used for operating chipping hammers, grinders and similar pieces of equipment for smoothing welded joints. Air operated rotary brushes are also used by pipe line contractors for cleaning pipe before it is sprayed with air driven spraying outfits.

There are a number of other pipe line operations now being performed by air and the portability of the Davey air compressor is facilitating the application of compressed air for these purposes. Because the outfit can be driven close to the point where the work is to be done long air lines are eliminated and convenient lengths of air hose used instead. This aids in handling and makes quick movement from point to point easier.



Handling gas pipe with air winch while it is being coated.

Air driven winch handling gas pipe along right of way.



Rolling pipe with compressed air driven device while it is being covered with protective coating.

OIL MAN'S CALENDAR

AUGUST

10—Denver, Colo., Oil States Advisory Committee.

31-Sept. 4—Buffalo, N. Y., American Chemical Society.

SEPTEMBER

1-3—Cleveland, Ohio, twentieth national aeronautic meeting, Society of Automotive Engineers.

16-18—Atlantic City, N. J., annual meeting, National Petroleum Association, Hotel Traymore.

28-29—Atlantic City, N. J., National Association of Motor Bus Operators, Hotel Ambassador.

OCTOBER

2-3—Houston, Tex., Petroleum Division, American Institute of Mining and Metallurgical Engineers.

12-16—Chicago, National Safety Council.

12-16—Atlantic City, N. J., American Gas Association.

14-16—Pittsburgh, Pa., Society of Industrial Engineers.

NOVEMBER

10-12—Chicago, twelfth annual meeting, American Petroleum Institute, Stevens Hotel.

16-21—Pittsburgh, Pa., third International Conference on Bituminous Coal, Carnegie Institute.

DECEMBER

7-12—Atlantic City, N. J., Trade Show, Motor and Equipment—National Standard Parts Association.

9-11—Atlantic City, N. J., American Institute of Chemical Engineers.

28-31—Tulsa, Geological Society of America, Mayo Hotel.

CLASSIFIED WANTS

Read by Oil Men Everywhere

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The rates for Classified Advertisements are 35 cents a line for the first insertion and 25 cents a line for each additional insertion. Six words usually constitute a line. The following table will enable you to figure the cost of your advertisement:

	1 time	2 times	3 times	4 times
3 lines	1.05	1.80	2.55	3.30
4 lines	1.40	2.40	3.40	4.40
5 lines	1.75	3.00	4.25	5.50
6 lines	2.10	3.60	5.10	6.60
7 lines	2.45	4.20	5.95	7.70
8 lines	2.80	4.80	6.80	8.80
9 lines	3.15	5.40	7.65	9.90
10 lines	3.50	6.00	8.50	11.00

Compute white space at the above rates.

For rates on Classified DISPLAY see opposite page.

Mail your Classified Advertisement to

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

EQUIPMENT WANTED

AM IN THE MARKET for standard steel 84 foot drilling rig and heavy duty rotary steel drilling rig. Also both standard and rotary drilling tools. Also casing in all sizes from 20" to 5½". Also steel tanks of various sizes. All equipment must be first class and very cheap. Address Box 467, Red Cloud, Nebraska.

WILL PAY CASH for 200 horsepower Fairbanks Morse used Diesel Engine and AC current generator. Southland Cottonseed Products Co., Kansas City, Mo.

WANTED—Used 50 or 75 KVA alternator for either 440 or 2,300 volts. Also exciter and switchboard equipment for same. Must be in good condition, priced right. Give location, price, full particulars. SUPERIOR TOOL CO., 804 Western Reserve Building, San Angelo, Texas.

FOR SALE—EQUIPMENT

INGERSOLL-RAND COMPRESSORS
With vertical intercoolers, good as new. (3) 10x4½x10 belt driven XOB, starting 1,000 lbs., working 750 lbs., cost new $2,141.00. (1) 11x5x10, XOB start. 750 lbs., working 400 lbs., cost $2,240.00. (1) 13x7x12, 300 lbs., 200 lbs., cost $2,585.00. Reasonably priced for quick sales.
MONTAGUE OIL CO.,
ZENORIA, LOUISIANA.

REFINING PLANT
For Sale

Consisting of three English 150 H. P. boilers; stills; pumps; valves; galvanized iron storage tanks; pipe most all sizes; air tanks; office furniture; fittings; tools; in fact, any or all parts to be sold at a bargain for quick sale.

Call or write Joseph Sonken, Walters, Oklahoma.

THREE MODEL NO. 35-38 BUCKEYE DITCHING MACHINES, Backfiller and Cleveland Tamping Roller,—only been used a few months and guaranteed to be just as good as new. Sacrifice for half factory price. Write or call for inspection. M. Wensel, 4029 South Benton, or Neal Smith, 7400 Main St., Kansas City, Mo.

FOR SALE for a low price. A gasoline powered Sullivan Diamond Core Drill. Write Box E-492, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE—EQUIPMENT

RECONDITIONED PIPE AND CASING. All Sizes. Our Prices Are Right.
LEE MORRISON SUPPLY CO.
BARTLESVILLE, OKLA.

200 Amp. Lincoln Arc Welder, 220/3/60. Practically new. Price $425.00. 100 Amp. Federal Butt Welder; 220 V. 60 cy. Complete. Excellent condition. $500.00. 12"x14" Chicago Pneumatic Air Compressor. $350.00. 46"x18' Niles Lathe, Quick change; $1,250.00. Also, large stock of lathes, shapers, mailing machines, pipe machines, bolt threaders; etc. Send for our list. Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West Second St., Cincinnati, O.

NEW WIRE ROPE FOR SALE
1¼, 1⅛ 1 and ⅞ Improved Plow Steel. 850, 1,050, 1,150 and 1,250-ft. lengths; 5,000 ft. ⅞ Improved Plow Steel, at 20c per ft; 10 reels Mild Plow Steel. 1 and ⅞, 5,000, 4,500, 4,000, 3,500 and 3,000-ft. lengths; all 6x19, hemp and wire centers; 50,000 ft. ¾, ⅝ and ⅞ Sand Lines, 6x7, 2,000 to 5,500-ft. lengths; low prices; immediate shipment. Address or wire Box E-525, The Oil and Gas Journal. Tulsa, Okla.

For Sale—The finest rotary drilling clay factory in Oklahoma. Bargain. Perfection Clay Co., Box 3103, Tulsa, Okla.

1 TYPE 10, 165 H.P. Direct Driven Bessemer Compressor, 1 Type 8, 80 H.P. same, 1 70 H.P. Bessemer Gas Engine, 1 8x8 Clayton Twin Compressor. All in A-1 shape and priced right. Nolan Sales Corp., 827 East First St., Tulsa, Okla.

FOR SALE—Slightly used Ingersoll-Rand steam two stage, 250-pound air compressor. Piston displacement. 312 cubic feet per minute at 200 r.p.m. Complete with intercooler and receiver. Write Box E-456, The Oil and Gas Journal, Tulsa, Okla.

If you can't find the kind of equipment you are looking for, insert an ad of your own, telling of your needs.

BUSINESS OPPORTUNITIES

DEEDED MINERAL interest spread covers 6 tracts one under 5,000 barrel well in Rusk County new field. Write for map. ⅛ mineral rights 142 acres Bee County 1,200 feet from 450 barrel well $250.00 basis. 7,905.5 acres new 10 year paid up lease ¼ royalty same term Edwards County, Texas, in active line of play $1.25 acre. Stieren & Koenig, Alamo National Bldg., San Antonio, Texas.

CHEAPER THAN leases. Owner offering fee 400 acres Crane County near production. Jeff Smith, Nalle Bldg., Austin, Texas.

OIL located before drilling. Geophysical method. Toggodometer Instrument; take pay in oil. No oil, no pay, except traveling and testing expenses, 95 per cent accuracy. O. P. Coffin. Caddo, Tex.

JOBERT OIL DRILLING COMPANY offers fifty divided assignments interest nonassessable in drilling well on forty acre lease, mile and half from production Kilgore, Texas. Interest money back from first oil runs before company receives a cent. One thousand dollars per. Send money to Citizens Bank or 300 South Saunders St., Tyler, Texas. No stock or units but ownership interest. Total interest in seven-eighths lease one hundred. Jobert Petroleum Company, 300 South Saunders, Tyler, Texas.

EAST TEXAS DEFERRED OIL PAYMENTS
Under big producing wells, Gregg and Rusk Counties, will sell at liberal discount. J. O. Garlington, Route 2, Longview, Texas.

WILL TRADE TAX EXEMPT 6% municipal assessment bonds for 200,000 bbls. or more East Texas or Oklahoma crude oil or some production. Some cash. Address T. F. McGuire, Suite 1432, 33 North La Salle Street, Chicago, Ill.

BUSINESS OPPORTUNITIES

CAN FINANCE legitimate deals requiring $2,500 or more. Corporations formed any state. Mail sales campaigns, booklets, etc. Coast Service, 314 W. Wilson Bldg., Huntington Park, Calif.

HAVE PERFECTED VERY SUCCESSFUL system for locating oil and gas structures. Charges reasonable. Write Box E-520, The Oil and Gas Journal, Tulsa, Okla.

HAVE MADE LOCATION, Oklahoma City Field, offsetting 41,000 bbl. Wilcox well. Will pay a few investors $10,000 out of first oil for $5,000 cash invested, as well progresses. Write Box 489, Shawnee, Okla.

PARTNER WANTED to assist in organizing a company to explore large blocks of prospective Oil and Sulphur lands in the Texas Gulf Coast. Prefer man who has connections with northern States and Canadian Paper and Rubber Manufacturers. Will arrange interview and inspection of properties. References exchanged. R. T. S., 211 S. High St., Longview, Texas.

WANT PARTY to assist in financing test well on 1,200 acre lease located within 12 miles of 15,000 Bbl. GUSHER in Anderson Co., Texas, close to pipe lines and R.R. Good geological report and in direct trend of large production. Will give 50/50 interest in entire lease for QUICK ACTION. Box E-506, The Oil and Gas Journal, Tulsa, Okla.

CAPITAL furnished worthy oil companies. Send full details your requirements to Box E-513, The Oil and Gas Journal, Tulsa, Okla.

$12.50 BUYS DEED part oil, 2 Oil Royalties City Pool. Ed Milam, Dept P., Oklahoma City, Okla.

EAST TEXAS OIL PAYMENTS

Deals have been negotiated on many proven leases in Lathrop, Bateman, and Joiner Pools. Purchase consideration paid part cash and balance in oil out of ¼ of ⅞ths of the total production. We have a few of these oil payments for sale at discounts of 50 to 65 per cent of face value. They are considered safe and excellent investments. Denominations $10,000 to $250,000.
American National Brokerage Co.
Care E. T. Marion,
Blackstone Hotel, Tyler, Tex.

REPAIR

OIL FIELD TRUCKS REPAIRED
SIBERLING TIRES
The Heaston-Carter Motor Service Co.
McPherson, Kansas.

Repairs and Parts for International Oil Field Trucks—Prompt Service.
Crary Hardware Co.,
McPherson, Kansas.

WANTED

EXPERIENCED OIL MAN. $5,000 investment required. Permanent position for right party. Write Box E-482, The Oil and Gas Journal, Tulsa, Okla.

PATENT ATTORNEYS

REGISTERED PATENT ATTORNEYS
United States and Canada
Before disclosing your invention to anyone, send for blank form.
Evidence of Conception
Bulletin "How to Establish Your Rights" and complete information free.
LANCASTER, ALLWINE & ROMMEL
240 Ouray Bldg., Washington, D. C

PATENTS—Write for our book, "How to Get Your Patent," and evidence of invention. Send model or sketch of invention for our examination and instructions free. Randolph & Co., Dept. 472, Washington, D. C.

MONEY RAISING

DO YOU NEED MONEY for organizing or financing oil or mining deals? Write 2443 N. W. 12th, Oklahoma City.

FINANCE YOUR OWN project with shares bonded. Quickest, most satisfactory known method of raising capital. Information free. Bankers Interstate Security, Electric Bldg., Denver, Colo.

IF YOU WANT your securities or proposition intelligently submitted to underwriting and security selling houses in New York, write W. W. Hines, Room 803, 150 Broadway, New York City.

CAPITAL: An exp. dependable broker will aid in financing projects of merit. Amster Leonard, East Orange, N. J.

CAPITAL—Call or send facts about high grade oil projects to James E. Miller Co., Room 200, New Brady Hotel, Tulsa, Okla.

CORPORATE ORGANIZING AND FINANCING
BROOKWORTH,
110 East 42nd St., New York.

WE CO-OPERATE in securing capital and guarantee to repurchase your securities. Send facts to the Stow Security System, 2057 Center St., Berkeley, Calif.

JOHN MORRIS, 3608 WARREN ST., PHILADELPHIA, PA., invites full facts first letter from capable parties planning negotiation of reasonable capital support for undertakings distinctly of higher order. Use registered mail, safeguard data.

SOUND PROPOSITIONS seeking capital for development or expansion send details. S. I. C., 82 Wall Street, New York City, N. Y.

JAMES E. MILLER CO. will co-operate with responsible firms or parties seeking aid in financing projects of higher order. Suite 200, New Brady Hotel, Tulsa, Okla.

OIL INDUSTRY PRINTING

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog.
New Mid-Continent Oil and Gas Ass'n. Unitization Committee Forms, Unit operating contract and accounting schedules. Samples gratis. Olds Press, 215 East Third Street, Tulsa, Okla.

FOR SALE—MAPS

SOUTHEAST NEW MEXICO
M A P S
Send for list.
THE M. H. HUNTER. CO.
Roswell, N. Mex.

OIL DEVELOPMENT maps, any county in Oklahoma, 75 cents each; lease block and detail maps. Write for map list. Lindsay Map Co., Franklin Bldg., Oklahoma City, Okla.

M-A-P-S

We have the only complete line of general area, lease ownership and oil development maps in East Texas.

Prices on Request

ZINGERY OIL MAP CO.
Fair Bldg. Fort Worth, Tex.

KANSAS OIL FIELD MAPS
The Kansas Blue Print Co.
Wichita, Kans.

HOTELS

HOTEL CUSHING
Cushing, Oklahoma
"Where Oil Men Meet"
Modern, Fireproof, Coffee Shop.

NEW BRADY HOTEL, TULSA, OKLA.
Tom Wilson, Mgr.
Fireproof, remodeled, new management. Free parking. Prompt, courteous service. Rates $1.00 up. Private baths $1.50.

HOTEL HAWLEY
McPherson, Kansas.
"The Oil Men's Home"
Modern fire-proof Hotel. Rooms $1.50 up.

BEAUCLAIR HOTEL
Okmulgee, Okla.
"Oil Men's Headquarters"
All Rooms with Bath $2, $2,50, $3.

CLASSIFIED WANTS

Create and Build Sales

LEASES—PRODUCTION

OIL LEASES AND ROYALTIES
Bought and Sold.
In the Hobbs Pool
Lea County, N. Mex.
A. L. Gurley, Clovis, N. Mex.
P. O. Box 211 Phone 392.

KETTLEMAN HILLS
320 ACRES in the North Dome Area where the Superior's Huffman wells, Petroleum Securities' Felix wells and Associated's Whipley wells are producing the greatest flow of high-gravity oil in California.

STANDARD OIL COMPANY
Owns the land joining this 320 acres on three sides. Each completion of above large wells tends to prove this land.

UNION OIL COMPANY
Purchased a half interest in an oil lease covering 160 acres in this area for which it is reported they are paying eight million dollars or $100,000 per acre—mind you, this is just for an oil lease.

This 320 ACRES is owned outright, it is not leased and we have an outlook of receiving that kind of money for an oil lease plus the money to be received from production by Royalty retained.

I NEED MONEY
Therefore, I will sell a portion of this valuable holding at excursion rates. To the right parties I may sell a half interest. Good stocks and properties will be considered as part payment. A. E. WRIGHT, 406 SUBWAY TERMINAL BLDG., LOS ANGELES, CALIF.

MARKET FOR TEXAS OIL WELLS. Leases. Royalties. H. Roscoe Burt, 825 Wilson Bldg., Dallas, Texas.

ROYALTIES—PRODUCTION

AM SPECIALIZING in Texas Panhandle gas production royalties and leases. Business is good, the reason is am making prices in line with conditions and handling a line we have a home market for, and the best investments in U. S. today. Thirty years in business here. Write E. B. Reeves, Alanreed, Gray County, Texas.

$5.00 BUYS COMPLETE PRODUCTION report of the Oklahoma City Pool showing 791 wells, their location, date completed, and total recovery each well and lease to June 1st, 1931. Clyde Kelly, 504 Continental Bldg., Oklahoma City, Okla.

MARKET FOR TEXAS OIL WELLS. Leases. Royalties. H. Roscoe Burt, 825 Wilson Bldg., Dallas, Texas.

MID-CONTINENT OIL ROYALTIES at reasonable prices and with assurance of safety. Past record "Chicago dealer since 1920" indicates quick return of principal and handsome profit. Write me. J. A. Wolf, 208 South LaSalle St., Chicago, Ill.

SNAP IN EAST TEXAS ROYALTY: 5 acre tracts and up full participating perpetual mineral deeds, in famous GREGG County, only $10.00 per acre. J. O. Garlington, Route 2, Longview, Texas.

ROYALTY DEALERS AND INVESTORS: Oil and gas royalties at 10% their value. Suite 8, Union Bldg. Prescott, Ariz.

$12.50 BUYS deed part oil, 2 Oil Royalties City Pool. Ed Milam, Dept. 5, Oklahoma City, Okla.

Responsible and old established company is offering $50,000 in royalty oil due from major company producing well, at a discount of 50%. Will receive subscription from $100 upward. Distribution made monthly free of operating costs. Invite corerspondence from investors or high class investment salesmen. Write Box E-523, The Oil and Gas Journal, Tulsa, Okla.

E. TEXAS PRODUCING ROYALTY
Under major company 65-acre lease. Three big wells. All locations good.
WILL SELL IN ONE-ACRE LOTS
John L. Dickson, Box 1037, Tulsa, Okla.

PRODUCTION, and nonproducing gas royalties, Stevens County, and Panhandle fields, Kansas, Oklahoma, and Texas royalties. Special service for brokers. List and maps. James R. Haynes, Grantville, Kansas.

ROYALTIES—PRODUCTION

WILL PAY CASH for producing Royalties anywhere. Send full information. Merrick C. Ham. Pres., Lamont & Co., Ltd., 1107-8 Bartlett Bldg., Los Angeles, Calif.

James B. McAnally

Speculative and Investment Royalties

Hunt Bldg., Tulsa, Okla.

A real royalty service for dealers. Now specializing in Oklahoma City Pool. Subscribing to all dependable sources of information—with buyers actually on the ground—taking our responsibilities seriously.

ROYALTIES on structure, under drilling wells, Stafford, Ellsworth Counties. Kans. Franklin, Gregg, Rusk, Upshur and other East Texas areas. Fast, dependable service for brokers and investors, in United States and Canada. James R. Haynes, Grantville, Kans.

MID-CONTINENT OIL ROYALTIES
Royalty Sales Company
Suite 523
105 North Clark St.,
Chicago, Ill.

BEDROCK ROYALTY PRICES ahead of drilling on major company blocks. $6 per square mile. Perpetual deeds and title warranty. Clearly stated and understandable interests. See maps and bulletins. R. R. Fisk, Box 1214-B, Wichita Falls, Texas.

PROFIT MOST from your interest in oil royalties. Read "The Royalty News." Published specifically for those interested in royalties. July number contains article showing 33⅓% increased income of Oklahoma City royalty owners by leases; East Texas feature; royalty transfer; and other valuable news. Yearly subscription $2 includes free large Oil Map 14 States. Write 618A World Building, Tulsa, Okla.

ROYALTIES—PRODUCTION

KILGORE—ROYALTIES, LEASES, and town property for sale. Let us handle your Kilgore interests. Friedman & Davis, Box 945, Kilgore, Texas.

INCORPORATIONS

CHARTERS — Delaware best, quickest, cheapest, most liberal. Free forms Colonial Charter Co., Wilmington, Del.

INCORPORATE YOUR BUSINESS. Delaware State Laws. Many advantages. Cost $46.50. Write Today. Free information. Dept. 16, Corporation Fiscal Co., Wilmington, Del.

TYPEWRITER RIBBONS

$1 TYPEWRITER RIBBONS SPECIAL at 75 cents each. Fay Young Typewriter Co., Tulsa, Okla. Phone 4-5973.

POSITIONS WANTED

DRAFTSMAN DESIRES POSITION: Eight years' experience pipe line, oil field, subdivision, and topographic maps, aerial mosaics and geographic calculations. Write Box E-519, The Oil and Gas Journal, Tulsa, Okla.

YOUNG TECHNICAL GRADUATE
With Gas-Lift and Drafting experience desires connection with oil company. Write Box E-502, The Oil and Gas Journal, Tulsa, Okla.

MANAGER AND SUPERINTENDENT
Graduate engineer, 12 years oil field experience with major and independent companies, in geological, scouting, land and leasing, drilling and production departments. Thoroughly experienced oil field manager with exceptional references. Will accept position in any of above departments or in charge of operations or developments. Write Box E-522, The Oil and Gas Journal, Tulsa, Okla.

PETROLEUM CHEMIST: Five years service as an analytical, research, and petroleum chemist. Excellent references. Write Box E-500, The Oil and Gas Journal, Tulsa, Okla.

USED EQUIPMENT

—is doing a large part of the work in East Texas — and is being sold through the Classified Columns of

The Oil and Gas Journal

Why Not Use This Medium to Dispose of Yours?

CLASSIFIED DEPARTMENT

CLASSIFIED DISPLAY RATES

The rate for Classified **Display** Advertising set in similar style to this Ad or in two Column style is as follows for each insertion:

1 inch	1 Time	$5.00
1 inch	13 Times	4.50
1 inch	26 Times	4.00
1 inch	52 Times	3.50

Rates for Classified without display shown on opposite page.

One point borders and ten point capitals are allowed, larger type not accepted.

Changes in copy must be in our office 10 days in advance of publication date.

Mail your advertisement to the Largest Classified Section in the Oil Industry.

THE OIL AND GAS JOURNAL
TULSA OKLAHOMA

POSITIONS WANTED

REFINERY SUPERINTENDENT
Now open for offer, fifteen years practical experience building and operating all types refineries. Technical training. Best references. Write Box E-501, The Oil and Gas Journal, Tulsa, Okla.

LAND AND LEASE MAN
College graduate, age 32, several years oil and gas experience, checking and buying leases and producing properties. Excellent references. Write Box E-521, The Oil and Gas Journal, Tulsa, Okla.

PRODUCTION SUPERINTENDENT with technical training and twelve years practical experience in various fields. Would like to make connection with reliable company about October first. Address Box E-511, The Oil and Gas Journal, Tulsa, Okla.

HELP WANTED

I NEED A SALESMAN to sell Oklahoma oil royalties and land. My plan would place you in business for yourself. Write Box E-493, The Oil and Gas

SALESMEN WANTED: Lea Co. N. M. leases and royalties, prices right, terms easy. Write Fred B. Manley, Roswell, N. Mex.

OLD LINE established refining company three refineries capacity, twenty thousand barrels daily requires services of sales-manager to handle fuel oil and gas oil production. Only highest type man presently or recently employed with established record of accomplishments who can produce immediate business in large volume need apply. Write P. O. Box 1920, Tulsa, Oklahoma, giving full details and personal interview will be arranged if thought desirable.

If your particular type of work is not advertised here, why not advertise your services, telling your qualifications and the type of work you are best fitted for?

Designing Engineer wanted by engineering and contracting firm, capable of designing and estimating atmospheric and vacuum pipe still distillation units, lubricating plants, treating plants, and general refinery construction. Write fully giving training, experience, former employers and salary expected first letter. Location middle west. Write Box E-524, The Oil and Gas Journal, Tulsa, Okla.

Chicago Gasoline in Stronger Position

Huge Holiday Gallonage. Some Regard Improvement as Temporary Being Skeptical of East Texas Restriction

By Robert C. Conine
Chicago Bureau, The Oil and Gas Journal, 6 North Michigan Ave.

CHICAGO, July 6.—As well as can be viewed with the naked eye and a mind inclined to skepticism only in the mildest form, the appearance of the gasoline markets in the Chicago district at the close of last week was one of continued improvement after a sudden turn for the better a little more than a week ago. However, there are those, and persons in responsible positions in the industry, who shake their heads gravely and refuse to be cheered. These unconvinced refiners and marketers are not of the ilk of pessimists who thoughtlessly inform the convalescent patient that "so and so" showed a remarkable improvement just before he died, and it would be foolish to ignore their arguments.

The most important fact at this time is that gasolines are holding a much stronger position than they did a week ago and the prices have advanced in the tank car markets for all the motor fuels as follows: 58-60 437 endpoint (U. S. Motor), up from 2¼ cents, low, 2½ cents, high, to 2½ cents and 2⅞ cents; 60-62 400 endpoint, from 2½ and 2⅞ cents to 2¾ and 3 cents; 64-66 375 endpoint, from 2¾ and 3 cents to 3⅛ and 3¼ cents; 68-70 360 endpoint, from 3 and 3¼ cents to 3¼ and 3½ cents. The 64-66 437 endpoint blended gasoline showed no betterment, remaining at 2⅛ to 2¼ cents.

Blending naphthas and natural gasoline have failed to show any improvement, although it is reported that some distributors are preparing to move considerable quantities of the blended motor fuel in cut-price channels this week. The 50-52 450 endpoint naphtha is quoted unchanged at 2¼ to 2½ cents. Natural gasoline markets at the close of the week were: Grade A, 72-79.9, 375 endpoint and 90 per cent recovery, 1⅞ cents; Grade AA, 80-87.9, 375 endpoint and 90 per cent recovery, 1½ to 1⅝ cents; Grade BB, 84-92, 375 endpoint and 85 per cent recovery, 1½ cents.

Huge Holiday Gallonage

Automobile processions out of Chicago were forming heavy traffic lines as early as Thursday before the fourth, and by Saturday the only inhabitants of the business section of the city, that is, the Loop district and south for about nine blocks, were a few wistful policemen directing the last straggling ends of the exodus of motordom to the country.

The weather for the July 4 celebration was ideal, neither too windy and dusty nor too hot for comfortable travel on the congested asphalt. The threat of rain was never farther removed, and officials of the government forest preserves where campers go had thought it advisable to warn picnickers that the preserves could accommodate only a mere half million seekers of the out of doors.

The holiday gasoline consumption is expected to bring further improvement in price in the tank car markets. However, there is not the slightest indication that the tank wagon and service station markets are due for an advance. In fact, it has been hinted in an important quarter that a price reduction in these markets soon would not come as a surprise.

Refiners, who are able to obtain tempting price concessions, have come to the front as buyers in the gasoline markets. Jobber inquiry had shown a continued increase up to the close of last week and Monday was not expected to bring a let-up in the buying activities of refiners and jobbers.

Two of the major companies have been taking considerable quantities of "distress" gasoline as it made its appearance on the market, and at least six of the smaller refiners have made purchases of from 75 to 100 cars of gasoline for delivery over July in each case.

Cheaper to Buy Than to Refine

Although the gasoline markets give good indications of strength at the prices quoted above, there is still some material, how much it has been impossible to ascertain even roughly, which must be moved at abnormally low prices. However, all the available reports disclose but one instance in the past week where U. S. Motor sold on the open market for less than 2¼ cents. Rumors of 2-cent gasoline have been assiduously tracked down and nothing more concrete than a third or fourth-hand statement involving an unnamed refiner and an undetermined quantity of gasoline rewarded the search.

Possible Reasons for Pessimism

Some of the arguments to the effect that the present upturn of the gasoline markets may be considered as a temporary flurry in a depression which is scheduled to remain with us for at least another year, are said to be more easily explained if one accepts a theory that these pessimists have been "caught short" on the bullish movement and are now forced to take heavy losses because of their lack of faith in the statistical condition of the industry and in the ability of the bona fide oil men to "do something" for the good of the industry. Such a theory would be unassailable were it not for the fact that marketing activities have shown an extreme wariness on the part of the seller not to commit himself too far ahead, and his caution has usually dictated a margin of safety of at least 3¼ cents for an upper limit. However, there are indications that some distributors have "taken chances" to obtain what was at the time a good order.

East Texas Still the Important Factor

East Texas is still the important factor to be considered in the gasoline markets as well as those of the other petroleum products. In oil circles here the apparently successful culmination of proration plans for the East Texas fields has failed to carry conviction that at last a curb is to be clamped down on the wells of that phenomenal field. In fact, when it was sought to ascertain the effects of the Texas Railroad Commission's action in putting into effect a schedule which called for far less production than suited the border-line prorationists, the responses of three select authorities (and of a much larger number of lesser lights) were, after striking out some half-hearted "howevers" and "on the other hands," on the side of grave doubt that anything short of the militia and general bankruptcy would lop 100,000 or so barrels a day from the East Texas crude oil production.

Demand Greater Than Supply

As long as the present relationship between supply and demand hold out, the marketers and refiners of the Chicago district contend, the gasoline markets can be expected to gain in strength and price and maintain a higher level at least until the motoring season begins to taper off in September. The important question, of course, is whether or not this relationship is to continue. There are disquieting reports to the effect that a number of refiners are preparing to take advantage of the increase in demand and the lowered gasoline stocks in storage by stepping up their crude oil runs to stills.

This disturbing factor has possibilities of growing in importance and eventually undoing the good work that has been accomplished by the men who have been keeping the welfare of the industry on an equal footing with that of their own companies on the sane grounds that immediate profits are not the goal of well-established business.

One major refiner expressed himself rather forcefully in connection with the prospects of widespread increase of runs to stills. "I can't understand why we continue to let ourselves be moved to help out a number of floundering refiners, when experience has taught us time and again that as soon as these refiners are out of the weeds they will use the money we paid them for their distress gasoline to buy up cheap crude, and before we know it these refiners are running their plants at full capacity to fill in the supply gap that opened during their late difficulties. One of these days the refiners who make it a practice to take distress gasoline off of the market will decide that the proper policy for companies that stay out of trouble is to let human nature and principles of economics take their course without interference."

Russian Gasoline in Chicago Reported

Two Soviet boats, loaded with gasoline, have in the past 10 days made their way, with an interval of a week between boats, on the lakes and into Lake Michigan. According to a report from a reliable source, the Russian gasoline carrier, Bomsted, reached Detroit last week and then cruised into Lake Michigan still laden with gasoline which the Soviets announced was destined for Sault Ste. Marie, Canada. It is pointed out that the Canadian port offers very little from a marketing angle, and there are marketers in Chicago who do not scoff at the notion that part of the Bomsted's cargo was transferred in midlake to a Chicago-bound steamer. Those who feel that the entrance of Russian gasoline into the American markets is a piece of Soviet propaganda contend that if Russian gasoline is helping Chicagoans celebrate the Fourth of July the Soviet boat would have steamed into the lake harbor boldly. On the other hand, it is pointed out, a Chicago buyer of Russian gasoline might be pardoned some reticence as to disclosing the source of his material, because "people do talk," and sales resistance is bad enough anyway.

Cut Rates May Depend on Blend

Practically out of a clear sky last week came the report of a sale of 100 cars of low endpoint blending naphtha of 54-56 gravity to a large distributor at Kansas City. On the same day a marketer in Chicago said that his kerosene sales had increased suddenly and inexplicably from one or two cars a week to 18 cars in four days. Further inquiry failed to reveal that there is a widespread increase in movement in these materials. The conclusion reached by several marketers in respect to the comparatively large naphtha order, especially, is that this material will be offered to trackage station operators who are being pressed by the constant cutting of third-grade gasoline on the part of the larger companies.

Offering of naphtha, it is pointed out, would be acceptable to trackage station operators who do their own blending of tax-free naphtha with a small proportion of taxed natural gasoline. Kerosene tank car markets are now slightly below that of U. S. Motor gasoline, and kerosene has the added attraction of being tax free. Natural gasoline is not improved in price. Natural gasoline markets at the close of last week are listed above.

All of the disturbing elements in the gasoline markets, however, are overshadowed by the evidence of bettered conditions in the fact that refiners are buying to serve the trade. Help in this form is coming from, among others, Standard Oil Co. of Indiana, The Texas Company, Mid-Continent Petroleum Corp., Pure Oil Co., Deep Rock Oil Corp., Wadhams Oil Co., Lincoln Oil Refining Co., Derby Oil Co., Kanotex Refining Co., Champlin Refining Co. and Marathon Oil Co.

The buying continues to be in small lots, with sellers hesitant to extend their offers even over the remainder of July. It seems to be the consensus that by the end of the month the U. S. Motor price will be beyond the 3-cent mark at the lowest.

Stanolind Blue Changes

If the expectations of several well-informed oil men materialize, this motoring season will cost automobile owners less than their fondest dreams could have predicted. In fact, there is a deep-seated conviction that trackage station operators will find means of dropping the service station postings lower, and in their wake will follow the majors with their cut-price competition gasoline which is selling for as little as 5 cents a gallon, plus tax, at several points in the territory.

New third-grade gasoline prices last week in the territory were: Mankato, tank wagon and service station, 12.5 cents; Milwaukee, tank wagon, 12 cents; St. Louis, tank wagon, 8.4 cents; Grand Rapids, tank wagon, 11.1 cents, and Detroit, tank wagon and service station, 9.1 cents.

Slight Freight Traffic Increase

Estimates of car loadings of revenues freight in the third quarter of this year, compiled by the shippers' regional advisory boards, show that petroleum and petroleum products are among the 5 of 29 principal commodities entering traffic which will show an increased rather than a decreased movement as compared with the corresponding period in 1930. Twenty-four commodities will show decreases in car loadings. Petroleum and its products, however, will have the least increase of the five favored with an improvement of only 0.1 per cent.

Lubricating Oils

Lubricating oil markets were unchanged in price although the quantity of material reported moving is steadily larger. The major companies have given no indication that the long expected retail price cut on finished lubricating oils is near.

Fuel Oil and Gas Oil

Fuel oil and gas oil markets were practically at a standstill last week, with little hope for improvement. One of the principal marketers of gas oil has almost withdrawn from the open market and is now cracking this distillate to produce gasoline to replenish lowered stocks. Prices at the close of the week were: 18-22 fuel oil, per barrel, 20 to 25 cents; 22-26 fuel oil, per barrel, 25 to 30 cents; 28-30 zero fuel oil, per barrel, 42½ to 47½ cents; 32-36 gas oil, industrial, ¾ to 1 cent; 32-36 zero gas oil, 1 to 1⅛ cents; 38-40 straw distillate, 1 to 1¼ cents.

These prices are for the better material in respect to viscosity and sulphur content. Other material is selling as low as 10 cents a barrel, basis Group 3, and heavy fuel oils for special uses, such as in blast furnaces, show practically no movement at any price. It is evident that in some quarters the railroads are going to find some very persistent salesmen of fuel oil. And it is just as evident that the railroads believe they have too much of this material already.

Gasoline Weakens in Eastern Market

But Consumption Shows Surprising Gains. Remainder of Refined Products Without Material Change During Week

By A. E. Mockler

New York Bureau, The Oil and Gas Journal, Rooms 1919-21, No. 154 Nassau Street

NEW YORK, July 6.—Gasoline weakened further in both refinery and tank wagon markets in the East during the past week, with a number of downward revisions in tank wagon and service station price levels by Standard Oil Co. of New York at various points in its territory. The weakening in gasoline comes at a time when the market is experiencing the heaviest demands of the year, and reflects the continued oversupply of gasoline from East Texas.

The remainder of the refined products market was without material change during the week, although the markets are still rather nervous, and susceptible to the bearish feeling engendered by the continued flooding of the market with cheap crude from the new flush producing fields in East Texas.

Stocks of gasoline showed a substantial reduction during the week ended June 27, and it is expected that figures for the week just ended will record a further heavy drawing against stocks, due to the heavy consumption over the week-end holiday.

Eastern oil interests were not surprised by the announcement by the Department of Commerce that the major oil importing companies will temporarily continue their restriction of imports, inaugurated last March at the suggestion of the Federal Oil Conservation Board. With East Texas distressed crude reported selling down to 5 cents a barrel, and gasoline from Texas refineries reputedly going out as low as 1½ cents per barrel, this combination of circumstances automatically takes care of the import problem. Shell, Gulf, Pan American and Standard of New Jersey are the principal importing companies. In connection with the movement of South American crude and products to the North American continent, it is reported here that Imperial Oil of Canada, Canadian affiliate of Standard of New Jersey, has substituted East Texas oil for Colombian and Venezuelan crude to a considerable extent.

Interest in the reported placing of a contract for delivery of a substantial quantity of Russian gasoline into Detroit has died down, with the report neither definitely confirmed nor disproved, and the trade is waiting for reports of the actual arrival of the Soviet motor fuel.

Refinery Gasoline

The posted range for U. S. Motor continues from 5½ to 6 cents a gallon in tank car lots at principal East Coast refinery points, but the market is far from steady at these levels, and 5¼ cents can be worked freely in some quarters of the trade, with reports of U. S. Motor moving out at as low as 5 cents. The plentiful supply of gasoline in the East has disrupted usual marketing channels in many instances, and the market is a mixed affair with sudden influxes of gasoline at various points creating considerable havoc.

Stocks of gasoline held by East Coast refiners as of June 27 totaled 7,558,000 bbls., against 7,655,000 bbls. on hand at the close of the previous week and 8,267,000 bbls. held at the end of May, but notwithstanding this favorable trend in the statistical position of the market, and a similar tendency toward curtailment of refinery holdings in other parts of the country, the spot market has failed to show any favorable reaction.

While the tenor of the spot market is definitely soft, there is a persistent feeling in many quarters that the market is about at bottom for the current price swing, and that an upward tendency may be expected to set in during the latter part of the month or early in August.

Consumption Surprising

Consumption figures in many sections of the East Coast territory are running into surprisingly large figures, marketers report, and it is evident that many of the earlier estimates of probable gallonage for the year will be substantially exceeded.

Refinery terminals were exceedingly busy during the past week, particularly toward the latter part of the period, in getting out tank car and barge shipments of motor fuel. Jobbers, who have been operating in hand-to-mouth volume for some weeks back, were filling up their storage in anticipation of a record breaking week-end over the Fourth of July, and early reports indicate that gallonage was fully up to expectations.

Large marketing companies in the East are meeting price competition in the tank car market as it develops, but it is believed by many that unless the market firms up to the posted level of 5½ cents very shortly, the principal sellers will cut their price to 5 cents, bring the price cutting out into the open, and establish a firm foundation for the market which will permit of an orderly price advance as consumption and general market conditions improve.

Kerosene

Volume in this division of the market has been disappointing for the past few weeks, and the market is reflecting to the full the condition of oversupply. The posted price for 41-43 water white kerosene in tank car lots at refinery terminals is held at 4¾ to 5 cents per gallon, but even the inside quotation is being shaded on occasion.

Tank wagon volume in kerosene has not come up to expectations, and the market is in easy position, although principal marketers have made revisions in their posted price schedules.

Tank Wagon Gasoline

Standard Oil Co. of New York this week announced a number of revisions in tank wagon and service station gasoline prices at various points in its territory, other marketers following in the changes.

The posted price at Syracuse, N. Y., was reduced 2.8 cents to 10 cents tank wagon and 12 cents service station. The posted quotation for tank wagon deliveries at Buffalo was cut 2 cents to 10.8 cents with the tank wagon price showing a corresponding drop. The posted tank wagon price at Rochester was reduced 2 cents to 11 cents, and the market at Providence, R. I., was cut 1.5 cents to 10.5 cents, the service station price dropping a corresponding amount to 12.5 cents.

Numerous other "unofficial" price revisions are developing from day to day in various parts of the territory, reflecting local competition, but these changes are not announced as they are but temporary in many instances.

The price situation in tank wagon markets in the East is still considerably unsettled, and no real improvement is looked for in this direction until the wholesale market at refinery terminals attains a greater degree of stability.

There was a substantial movement of gasoline into tank wagon markets throughout the week, and the market was especially busy at the week-end, with retailers keeping their storage filled to capacity for the holiday business. While sales in metropolitan territory were large, the activity was particularly marked in the suburban areas, where the bulk of the motor travel for the holiday week-end is looked for. Reports from leading marketers indicate that gallonage in the local area has shown a surprising gain during the past month, and it is now believed that notwithstanding some of the gloomy predictions made a few months ago, aggregate gallonage for the year in this territory will show a healthy gain over last year.

Gas Oil

The posted price for 28 plus recycled gas oil remains unchanged at 4 cents per gallon, bulk, at refinery terminals, and the market remains in quiet position. Demand is spotty, and buyers are looking for concessions on term contracts, in view of the low priced offerings from the Gulf and elsewhere.

Notwithstanding curtailment of refinery operations, stocks of gas and fuel oil continue to increase at East Coast refineries, holdings as of June 27 totaling 9,424,000 bbls., against 9,238,000 bbls. at the close of the previous week and 8,738,000 bbls. on hand at the end of May.

Wax

Continued irregularity has characterized trading in the paraffin wax market, with prices nominally unchanged on all grades. Domestic buyers are still hesitant and are confining their purchases to small quantities for prompt shipment, being disinclined to book on later requirements, and export interest has also eased off somewhat.

Stocks of wax on hand at domestic refineries at the close of May totaled 205,803,000 pounds, against 205,105,000 pounds at the close of the previous month and 248,524,000 pounds on hand at the end of May, 1930. Both domestic demand and exports fell off substantially during May.

Petrolatum

Price changes were lacking in this branch of the market, although the undertone was still somewhat inclined to weakness. Consuming manufacturers in the pharmaceutical manufacturing field are not taking petrolatum stocks in their accustomed quantities, and the demand from other quarters, including the export field, has also fallen off somewhat during recent weeks.

Diesel Oil

Spot volume for the month just ended was well maintained, and the outlook for July is generally favorable. With the market down to $1.55 per barrel, terminals, the lowest price on record, local refiners believe that their market is now on a competitive footing, but are watching the situation closely to protect their outlets from price competition from other points.

Contract withdrawals have been well maintained, although some falling off is indicated during the next few months, as the result of the announcement of the cancellation of a number of transatlantic sailings. It is hoped in oil circles here that the loss of this business will be entirely offset through the placing of some of these vessels in the week-end cruise business out of New York, but it is too early yet for a definite forecast in this respect.

Standard Oil Co. of New Jersey has announced a reduction of one-half cent per gallon to 4 cents in the price of Diesel oil at Port Tampa, Jacksonville, and Savannah.

Fuel Oil

East Coast refiners continue to quote bunker "C" oil at 85 cents per barrel, in bulk, at refinery terminals, with the usual charge of 5 cents per barrel for lighterage alongside in harbor limits, and movement was fairly steady along routine lines during the past week.

Distressed fuel oil at low prices is by no means a rarity at the Gulf these days, and refiners in this territory are keeping a close check on the situation to protect their established outlets against any dumping of Texas fuel oil which might develop.

Industrial demand for fuel oil is showing the usual seasonal slackening, and quiet trading is reported from this division of the market, with prices showing an easy undertone.

Export Market

Considerable trading developed in the Gulf export market, with six cargoes booked and a number of additional inquiries in the market.

A cargo of 10,000 tons of U. S. Navy was reported booked at 3⅛ cents, but the time of lifting and destination were not disclosed. A part cargo of 6,000 tons of 64-66 was booked for end of July loading for France at 3½ cents. A mixed cargo of 4,500 tons of 64-66, 2,000 tons of water white, 1,000 tons of prime white, and 1,000 tons of navy was booked for August loading for France, and another cargo of 4,500 tons of 64-66, and 1,000 tons each of water white, prime white, and navy was booked for the same destination, also for August loading. A straight cargo of 8,000 tons of 64-66 was booked for August shipment to United Kingdom or continent (probably France) was closed, and another of 6,000 to 8,000 tons of 64-66, also for France, and for August loading.

Inquiries for four cargoes of Gulf U. S. Motor gasoline for domestic shipment were reported in the local market during the week.

In the crude oil market, France was inquiring for four to five cargoes of East Texas crude for July-August-September loading, but reports of sales of crude in the field at as low as 5 cents per barrel arrested the placing of this business. A Scandinavian inquiry is in the market for five or six cargoes of East Texas crude, for shipment over 12 months, and a spot cargo was offering during the week at 50 cents per barrel, f.o.b. Gulf.

Venezuelan crude continued to offer at 57 cents per barrel and Panuco at 46 cents, less taxes, although the market for the latter appears to be tightening up somewhat, and supplies are by no means liberal.

Petroleum Exports

Aggregate movement of refined products into export channels through the local port showed improvement during the week ended June 27, and export operators were more encouraged over the outlook for the balance of the year. The better feeling discernible in some divisions of the refined products trade has stimulated confidence among export buyers, and it is believed that considerable business which has been tentatively in the market during the past several weeks will now be closed.

The following table shows principal exports of refined petroleum products from New York for the past three weeks (all figures in gallons unless otherwise noted):

	Week ended		
	June 27	June 20	June 13
Gasoline	110,000	25,000	175,000
Naphtha	.....	15,000	275,000
Kerosene	75,000	40,000	95,000
Fuel oil	48,000	160,000	6,000
Lubricating oil	1,120,000	1,340,000	785,000
Petroleum, refined	320,000	1,745,000	480,000
	Pounds		
Petrolatum	.....	.....	20,000
Paraffin wax	1,315,000	1,000,000	1,060,000
Refined	225,000	25,000	.....
Scale	1,290,000	190,000	240,000
Lubricating grease	1,075,000	600,000	765,000

In connection with competition of Russian refined products in export markets here, and particularly the reports of the superlative quality of some of the Russian products, the trade here was interested in a statement by Wiley Post, pilot of the record breaking globe girdling plane "Winnie Mae" that the only mechanical trouble which the plane encoun-

tered en route was due to some poor lub oil picked up at a stop in Russia, which fouled the plugs.

Russian cased gasoline, which has come into South American markets in a large way during the past few months, is reported running into some snags in trade circles, due to the fact that the containers are not of standard construction and content.

Imports

Imports of crude and refined petroleum at the principal United States ports for the week ended June 27 totaled 1,083,000 bbls., a daily average of 154,714 bbls., compared with 1,111,000 bbls., a daily average of 158,714 bbls. for the previous week and a daily average of 185,036 bbls. for the four weeks ended June 27. Details follow:

(Barrels of 42 Gallons)

At Atlantic Coast Ports—	
Baltimore	174,000
Boston	83,000
New York	462,000
Philadelphia	137,000
Others	167,000
Total	1,023,000
Daily average	146,143
At Gulf Coast Ports—	
Galveston district	60,000
Total	60,000
Daily average	8,571
At Atlantic & Gulf Coast Ports—	
Total	1,083,000
Daily average	154,714
Daily average four weeks	185,036

Distribution of total imports is as follows:

Crude	806,000
Gasoline	40,000
Fuel oil	237,000

Imports of both crude oil and refined products have fallen off substantially at Gulf Coast ports during recent months, owing to the influence of cheap crude and gasoline from the East Texas area, and Gulf Coast markets are now virtually free of competition from South American sellers. Large integrated companies, however, continue to move both crude and refined products from South America into East Coast markets, under the provisions of the voluntary import curb agreed upon by the leading interests some months ago. It is expected that curtailment of import movement will continue as a matter of course during the remainder of 1931.

California Oil Receipts

Receipts of California crude and refined petroleum at Atlantic and Gulf Coast ports for the week ended June 27 totaled 156,000 bbls., a daily average of 22,286 bbls., compared with 173,000 bbls., a daily average of 24,714 bbls. for the previous week and a daily average of 33,786 bbls. for the four weeks ended June 27. Details follow:

(Barrels of 42 Gallons)

At Atlantic Coast Ports—	
New York	75,000
Others	81,000
Total	156,000
Daily average	22,286
At Gulf Coast Ports—	
All ports	None
At Atlantic & Gulf Coast Ports—	
Total	156,000
Daily average	22,286
Daily average four weeks	33,786

Distribution of California oil receipts is as follows:

Gasoline	148,000
Lubricants	8,000

Shipments of California refined products for Atlantic and Gulf Coast ports during the week (with identity of owner of tanker moving the oil where such owner is an oil company) follow:

For New York—45,300 bbls. of gasoline on the Pueblo; 45,000 bbls. of gasoline and 33,000 bbls. of kerosene on the Thomas H. Wheeler (Standard Oil Co. of New Jersey); 130,000 bbls. of gasoline on the Tamiahua (Richfield); and 67,000 bbls. of gasoline and 8,000 bbls. of lubricating oil on the Solana (Tide Water Associated).

For Baltimore—73,100 bbls. of gasoline on the Pennsylvania (The Texas Company).

For Wilmington, N. C.—50,000 bbls. of gasoline and 14,000 bbls. of kerosene on the Benjamin Brewster (Standard Oil Co. of New Jersey).

Movement of California gasoline into the Gulf Coast territory has virtually come to a standstill, low prices for East Texas gasoline proving an effective barrier to the Pacific Coast product, except in instances where integrated companies with California production move small lots of California motor fuel into the Gulf area, principally for use in blending.

Charter Market

Soviet charters continue to furnish a large part of the business in the tanker market, but increasing interest is being shown in vessels for moving both clean oil and crude from the Gulf to United Kingdom continent destinations, with the probability of several early fixtures for late July, August and September lifting.

The market continues plentifully supplied with tonnage, however, and rates remain low.

Sixtures reported during the past week included the following:

Steamer Omphale (French), 4,000 tons, clean, part cargo, Constanza to Rouen, 7s 6d, July loading.

Motorship Gianna M. (Italian), 6,000 tons, gas oil, Constanza to London, 7s 3d, prompt.

Motorship Norvinn (Norwegian), 9,000 tons, clean, Gulf to French Atlantic, 9/-, option North Atlantic loading, 8/-, July-August.

Motorship Athelempress (British), 12,000 tons, clean, option 2,000 tons dirty, Black Sea to Vladivostok and/or Amur Bay, 16/9, July.

Steamer Cities Service (American), Gulf to North of Hatteras, 15 cents, two trips, July loading.

Motorship Oilreliance (British), 7,500 tons, or sub., Constanza 6s 9d, Black Sea, 7s, option both 7s 6d to French Atlantic ports, option North of Hatteras loading, 8s, Curacao loading, 8s 6d, Gulf 9s, Tampico 10s, August 15/31, cancelling.

NEW PROCESS FOR CLEANING OUT WELLS

(Continued from Page 17)

later acid may be used where difficulty is not encountered due to the formation of calcium sulphate. Mixtures of these acids may be used and other acids are operative but in general are too expensive.

The treating solution should be brought into contact with the entire exposed surface of the oil sand. This may be done by maintaining a solution level at the top of the oil sand, or if this is not practical, agitation may be provided to splash the solution against the sand.

A charge of gas-generating chemical is added to the acid. This chemical is one which evolves a large amount of heat by reaction with the acid and/or water, simultaneously liberating a gas, preferably a hydrocarbon gas, soluble in the oil. Metallic carbides are best adapted for this purpose. Calcium carbide, which yields acetylene, is preferred. Aluminum carbide, which yields methane, may also be used.

This gas may be ignited to increase the heating effect. Any suitable ignition means may be used, but it is generally most convenient to add a substance which upon contact with the charge will spontaneously ignite the gas. Sodium peroxide or an alkali metal may be used, the first chemical being especially desirable because it will yield oxygen and enable the combustion to be continued independent of the air normally available in the well. Additional oxygen or air may be supplied through pipes from the surface or otherwise.

Packer Used

In general it is planned to place a removable packer at approximately the top of the oil sand soon after the reagents are placed and the gas is thus confined to the space opposite the sand body. It is sometimes necessary to allow time for the acid to dissolve away any deposit of calcite from the walls of the well before setting the packer. If considerable paraffin has accumulated on the walls of the well, it may be desirable to bail out the molten paraffin and introduce fresh chemicals before setting the packer. In serious cases, several applications of acid may be required to remove calcite sufficiently for entrance of gas into the pores of the sand.

The pressure generated below the packer causes the gas to penetrate outwardly from the bottom of the well into the oil sand where it is dissolved by the oil. The viscosity of the oil is considerably reduced and flow is correspondingly facilitated. The pressure also drives the acid into the sand so that it may act upon any calcite or other deposits which cement the sand grains together. Paraffin, asphalt, oxidized or saponified oil, and other obstructing carbanaceous deposits, are melted by the heat of reaction. The violent agitation of the reaction mass by boiling and escape of gas exerts a washing action on the wall of the sand.

When the reaction mass begins to cool the packer is removed and the well bailed or pumped while the fluids in it are still at a temperature above that at which paraffin congeals.

Since the acids are neutralized or almost neutralized by reaction with the added chemicals or the calcite, etc., there is no substantial corrosion of the equipment in the well due to this system of cleaning.

Use of Bailer

An alternative plan contemplates treatment of the well with the reagents specified, and by the methods proposed in sequence. In this procedure a "string" of tubing is run into the well, supporting a well packer at its lower end designed to close off the space between the tubing and outer casing or wall of the well immediately above the oil sand.

A bailer is provided having a diameter sufficiently small to permit of its free passage through the tubing. The fluid in the well is bailed down as far as may be practicable, and a quantity of acid of sufficient strength to attack the carbonate deposits on and within the wall rocks is introduced. The quantity of acid used should be in excess of that which will react with calcite or other deposits.

If possible the volume of acid solution should be sufficient to nearly fill the well to the top of the oil producing formations. If this is not feasible, a smaller quantity may be used and the bailer churned up and down in it to splash it thoroughly and repeatedly over the walls. Air pressure is applied through the tubing to force the acid to enter the pore spaces of the wall rocks. The pressure so provided will also be assisted to some extent by the pressure of carbon dioxide generated by action of the acid on the carbonate materials.

After the acid has been forced into the wall rocks as far as the available pressure permits, the pressure is relieved at the tubing head and a charge of carbide or other heat producing reagent is dumped into the well with the bailer. Reaction of this material with the residual acid and water in the bottom of the well will create heat which melts paraffin and other solid hydrocarbons on and within the wall rocks.

The bailer is withdrawn and a swab is operated in the tubing to draw all molten paraffin and residual acid from the pore spaces of the wall rocks into the well. The fluid material is then quickly bailed out before it has had time to cool appreciably.

Example of Process

To an oil well containing water, commercial concentrated hydrochloric acid and granular calcium carbide are introduced at the rate of about 50 pounds each for each 10 feet of sand depth. The acid may be dilute, as even weak acid will dissolve the mineral carbonates. Next about 5 pounds of sodium peroxide are added and within a few minutes a packer is set at about the level of the top of the oil sand. The reaction mixture is allowed to remain in the well for about two hours and is then bailed out, after which the same process may be repeated if necessary. Pumping is begun as quickly as possible, and it is anticipated that the oil production for a well so treated will be increased as much as five times that obtained before treating the well. The inventors state that the yield should ordinarily be increased from 3 to 10 times or more and base this statement upon work already done in shallow wells in the Petrolia Field, Ontario, Canada.

A half interest in this patent has been assigned to the Standard Oil Development Co., a Delaware corporation with its main office at 26 Broadway, New York City. This process has been developed and used to some extent in the Petrolia, Oil Springs and Bothwell Fields of Ontario, Canada, where the producing formation is about 400 feet deep.

Crude Shipments From East Texas Less Than Average Daily Output

FORT WORTH, Tex., July 4.—Of the total production of East Texas for the week ending July 1, an average of 359,704 bbls. per day, 342,357 bbls. per day was distributed to markets, with 203,140 bbls. run by the eight pipe lines, 114,296 bbls. shipped by tank cars from 26 loading racks and 24,921 bbls. used by six East Texas refineries. A daily average of 17,370 bbls. went into storage.

Daily average tank car shipments were: Toronto Pipe Line Co., 2,210 bbls.; Stanolind Oil & Gas Co., 2,070 bbls.; Sinclair Texas Pipe Line Co., 16,980 bbls.; Shell Petroleum Corp., 20,855 bbls.; Sabine Pipe Line Co., 857 bbls.; Republic Production Co., 343 bbls.; Oriental Oil Co., 205 bbls.; Houston Oil Co., 4,279 bbls.; Humble Oil & Refining Co., 5,095 bbls.; Central Pipe Line Co., 117 bbls.; Woodley Petroleum Co., 4,200 bbls.; Butler & Calhoun, 2,640 bbls.; Crown Pipe Line Co., 6,274 bbls.; Hunter Oil Corp., 2,920 bbls.; Inland Waterways Pipe Line Co., 3,500 bbls.; Arkansas Fuel Oil Co., 7,000 bbls.; F. & M. Transport Co., 6,689 bbls.; Simms Oil Co., 7,961 bbls.; Texas Pacific Coal & Oil Co., 723 bbls.; East Texas Refining Co. (two racks), 1,637 bbls.; Pilot Oil Co. (two racks), 3,352 bbls.; Illinois Pipe Line Co. (two racks), 1,648 bbls.

Daily average pipe line runs were: Atlas Pipe Line Co., to Shreveport, 25,406 bbls.; Arkansas Pipe Line Co. to Shreveport, 31,210 bbls.; Gulf Pipe Line Co. to Port Arthur, 26,355 bbls.; Houston Oil Co. to Amigo, 5,670 bbls.; Humble Pipe Line Co. to Shreveport, 20,243 bbls.; Magnolia Pipe Line Co. to Center, 28,843 bbls.; Texas Pipe Line Co. to Douglass, 44,815 bbls.; Humble Pipe Line Co. to Todd, 20,598 bbls.

East Texas refineries consumed East Texas crude daily as follows: Taylor Refining Co. at Tyler, 6,843 bbls.; Boone Refining Co. at Arp, 375 bbls.; Overton Refining Co. at Overton, 1,600 bbls.; East Texas Refining Co. at Longview, 8,596 bbls.; East Texas Refining Co. at Friars Switch, 5,532 bbls.; Beacon Refining Co. at Henderson, 1,975 bbls.

WELDING ALLEGHENY METAL

In the article on welding Allegheny metal by G. Van Dyke in the July 2 issue the author calls attention to two or three errors. When this metal is heated to any temperature in excess of about 450° F. it will discolor or oxidize on the surface.

It is unfortunately true that metals of the 18-8 type if heated to temperatures within the range of 950° to 1,550° F. will during certain periods of time, and depending on the temperature, undergo a structural change in which some of the carbon will be precipitated from solution and be converted into an iron carbide, or perhaps an iron chromium carbide. These carbides accumulate along the grain boundaries of the metal, and if the metal is then subjected to heavy corrosive attack, such as nitric acid, hot salt water, copper sulphate solution and so forth, an electrolytic effect may be developed which will destroy the metal.

It is obvious that in welding, the metal is at some point heated to these temperatures and, therefore, there is always an area adjacent to the weld which will have a lower corrosion resistance than the parent metal. This carbide precipitation does not occur instantaneously, but requires a certain amount of time to develop.

ADDITIONAL COPIES OF THE PIPE LINE WALL MAP

which appeared in our June 4 issue are available to those desiring them at a cost of $1 per copy.

This map is 36″ x 48″ and shows all oil, gas and gasoline trunk pipe lines in the United States. It is printed on extra heavy bond paper.

MAIL REQUEST TODAY

The map is copyrighted and is not available from any other source.

The OIL and GAS JOURNAL
PRODUCING REFINING PIPELINE ENGINEERING MARKETING
TULSA, OKLA.

ROCKY MOUNTAIN AREA

(Continued from Page 44)

it was abandoned on account of casing trouble and rig skidded.

Hot Springs

Westland Oils, Inc.'s No. 1, SW cor SE, Section 23-44-95, Gebo Dome, is shut down at 1,510 feet.

Johnson County

United Oil Co.'s No. 2, SE cor., Section 7-46-82, Crazy Woman Creek, is reported abandoned at 1,810 feet. The leases were acquired in 1929 from the Fairway Oil Co., and No. 2 was drilled half a mile southeast of No. 1. The first Wall Creek was expected at around 800 feet.

Sheridan County

A new operation is reported in the R. & D. Oil Co.'s No. 1 Morton Mock, NW cor. SE, Section 21-57-87, 11 miles south of the Montana line. It is west of a well drilled a year ago by Orville Pfeiffer which had a flow of 150,000 feet of gas per day at 200 feet. Gas from this well is being used for fuel.

Laramie County

Prairie Oil & Gas Co.'s No. 1 Warren, SE NE SE, Section 22-13-68, southwest of Cheyenne, is bottomed at 205 feet and getting ready to run 15½-inch.

Carbon County

Pacific American Oil Co.'s No. 1, SW SW, Section 32-25-89, Bull Springs, is reported abandoned at 450 feet. This well was started in 1928 and later in that year was taken over from Lawrence Leuthert and others with the intentions of drilling a little deeper to determine whether there was a structure.

Midwest Refining Co.'s No. 27 Union Pacific, NW SE SE, Section 11-20-81, Elk Mountain, is drilling at 2,860 feet in gray shale.

Producers & Refiners Corp.'s No. 1, SW cor., Section 19-20-83, Overland Dome, is drilling at 925 feet in sand.

Fremont County

Producers & Refiners Corp.'s No. 2, SE NE NE, Section 9-32-95, Big Sand Draw, is plugging to abandon at a total depth of 3,762 feet. It was drilled to this depth last fall, where it encountered water that flowed over the top. It is on the northwestern flank of the structure. Same company's No. 10, SE NW SW, Section 14-32-95, the deep test which went to the bottom of the Sundance at a total depth of 5,351 feet, is standing cemented. It was cemented at 5,192 feet with 55 sacks. It had water in the Sundance and is being plugged back to save as a gas well in the upper horizons.

Producers & Refiners' No. 2, NW SE NW, Section 33-34-92, Muskrat Dome, is bottomed at 5,760 feet and waiting for tester. It was supposed to have been in the Muddy at 5,573 feet.

Kinney-Coastal Oil Co. has made a tentative location on the Heslin tract in the C NW NE, Section 22-3n-1w, on the Pilot Butte Dome, purchased an electric drive rotary rig and is building power line. This location is three-fourths of a mile northeast of its No. 1 Dykeman, which was completed in the Muddy sand with an open flow of better than 80,000,000 feet of gas per day.

Lander Corp.'s No. 2, NW cor. NE, Section 35-33-99, Bartram Gap, is shut down at 1,350 feet in the red beds. Big Horn Oil Co.'s No. 1 Gabus, SW cor., Section 14-38-94, is drilling at 600 feet. Ward Oil & Gas Co.'s No. 1, NE cor., Section 28-34-90, Dutton Basin, is shut down at 2,100 feet.

Sweetwater County

Mountain Fuel Supply Co.'s No. 1 Tucker, C NW SE, Section 18-13-99, Alkali Butte, is rigging up to resume at 3,630 feet after being shut down for the winter. Vermillion Oil Co.'s No. 1, SW cor., Section 16-12-99, Hiawatha Dome, had a show of oil at 3,510-42 feet and 50,000 feet of gas. Hidden Treasure Oil Co.'s No. 1, SW cor., Section 32-21-103, North Baxter Basin, is shut down at 4,243 feet, and Tower Petroleum Co.'s No. 1, SW cor. SE, Section 31-15-103, is shut down at 4,660 feet.

Uinta County

Park City Oil & Gas Co.'s No. 1 Christensen, NE cor., Section 6-15-113, Lyman district, is shut down at 4,200 feet.

MONTANA

Glacier County

L. B. O'Neil, trustee's No. 1 State, C NW NW, Section 33-36n-5w, Cut Bank Field, in Glacier County, the first of the seven wells being drilled to develop a supply of gas for the Montana Power Co.'s pipe line to Helena and Butte, was the first to reach the gas sand and came in at an undisclosed depth. Mr. O'Neil is not giving out any information regarding the wells and the depth or gauged flow is not known. A field estimate places the flow at 20,000,000 feet a day, which may be a little large, judging from what other wells in the area have done. This well is half a mile southwest of No. 1 Michaels, the discovery well, which was completed in 1930 as a 15,000,000-foot gasser from sand at 2,750-71 feet.

The reported status of the drilling wells is as follows:

No. 1 Berger, C SE NE, Section 2-35-5w, drilling at 500 feet; No. 1 Hughes, C NW SE, Section 3-35-5w, drilling at 500 feet; No. 1 Taylor & Spikes, C SW SW, Section 35-36-5w, drilling below 2,000 feet; No. 1 Schneider, C NE SE, Section 32-36-5w, drilling at 1,750 feet; No. 1 State, C SE NW, Section 34-26-5w, drilling at 2,050 feet; No. 1 State, C SW SW, Section 36-36-5w, drilling at 1,200 feet.

B. & H. Oil Co.'s No. 1 Haines, C SE SE, Section 2-34n-6w, Cut Bank area, was completed in sand at 2,761-85 feet with an initial production of 50 bbls. Fulton Petroleum Co.'s No. 1 Blackfeet, SW NE NE, Section 28-36-12w, Milk River district, is drilling at 2,140 feet. The location of B. & H. Oil Co.'s No. 1 Yunck, is NE SE SW, Section 14-34-6w, instead of Section 23. It shut down after spudding.

Carbon County

Ohio Oil Co.'s No. 1 Montana Industrial, SE SW NE. Section 11-7s-21, Dry Creek, cemented 9⅝-inch at 5,581 feet, on top of the Lakota sand, which is showing a little oil and gas. The upper sands of the series did not show commercial production. Same company's No. 1 Chapman, C SW SW, Section 2-7-21, cemented the 13⅜-inch at 839 feet, and its No. 1 Souders, C SW SE, Section 2-7-21, is coring at 4,047 feet. The rig up for Ohio Oil Co.'s No. 3 Day, SE cor. NW, Section 11-7-21, has been moved away. Carbon Oil & Gas Co.'s No. 1 Armstrong, SW cor. NW, Section 7-7-22, is drilling at 2,780 feet. The Spomont Oil Co.'s No. 1 Cruse, SE cor., Section 32-6s-18, Roscoe district, is shut down after spudding.

Carter County

Minnesota Oil & Development Co.'s No. 1 Nuziman, SE cor. SW, Section 7-8s-78, is shut down at 1,030 feet.

Liberty County

G. G. Howard's No. 1 Lange, C SE SW, Section 7-36-6e, Bear's Den, is drilling at 1,500 feet, and his No. 2 Schoonover, C SE NE, Section 13-36-5e, has rig up. Utopia Oil Co.'s No. 1 Eleanor, SE SE, Section 11-33-6e, Utopia district, is shut down at 3,214 feet with hole full of water.

Toole County

In the Kevin-Sunburst Field, Majestic Oil & Gas Co.'s No. 2 Davis, SE NW SE, Section 27-35-3w, was completed for 250,000 feet of gas in the Sunburst sand at 1,350-60 feet, and its No. 3 Davis, NE cor. SW, Section 27-35-3w, was completed for 500,000 feet of gas at a total depth of 1,773 feet. Vantana Oil Co.'s No. 1 Rock, SW cor. NE, Section 27-35-3w, was completed in the Ellis at 1,639-50 feet for 15 bbls. per day. Total depth was 1,667 feet. Diamond Oil Co.'s No. 18 McCormick, NW NW, Section 33-35-2w, was completed at a total depth of 1,500 feet for 30 bbls. per day. The Sunburst was at 1,230-45 feet and the Ellis at 1,492-96 feet. Potlatch Oil & Gas Co.'s deep test in its No. 1 Adams, SE NE NW, Section 21-34-1w, was abandoned at 4,672 feet.

E. C. Moffitt's No. 1 Dunham, NW cor., Section 1-33-1w, is drilling at 1,225 feet, and No. 1 Kastor, SW NW SE, Section 27-35-1w, has rig up. The Five Forty Oil Co.'s No. 2 Donovan, C NE NW, Section 34-33-2w, is drilling at 1,500 feet.

Teton County

California Co.'s No. 1 Sullivan, NW NE NW, Section 34-27-7w, Bynum district, is drilling at 575 feet.

Rosebud County

Prairie Oil & Gas Co.'s No. 1-X, Contract 3, NE SW NW, Section 26-10-39, Porcupine Dome, is bottomed at 2,415 feet and filling in and drilling out rock, and its No. 1, Contract 4, SE SW SW, Section 28-11-39, is bottomed at 1,360 feet and pulling the 12½-inch which would not go through.

Hill County

Montana Consolidated Gas Co.'s No. 2 Roebuck, C NE SE, Section 33-33-12e, Kremlin district, is rigging to complete. It has been shut down at 740 feet. Same company's No. 1 Stranahan, NW cor. NE, Section 14-32-17e, Box Elder, was completed at a total depth of 1,275 feet as a gas well, but not tested. The gas was from sand at 1,271-75 feet.

Cascade County

Lone Star Montana Oil Co.'s No. 1 McLean, NE SW SW, Section 13-21-3e, Blackhorse Lake, spudded and is shut down. Andover Oil Co.'s No. 1 Floweree, NW cor. SE, Section 20-1n-2w, is drilling at 1,900 feet.

UTAH

Utah Southern Oil Co.'s No. 1 Balsey, C NE NE, Section 31-23-21, Salt Valley, which showed for 15 bbls. daily, settled, at a total depth of 3,500 feet, is shut down pending a meeting of the association to determine future plans. Western Petroleum Drilling Co.'s No. 1 Nebeker, near the Utah Oil Refining Co.'s plant, is drilling at 1,400 feet. This test may be carried to 5,000 feet, if necessary.

Runs From the Fields

Average daily pipe line runs in week ending July 4:

WYOMING

Salt Creek	24,820
Big Muddy	1,880
Byron	5
Dallas-Derby	520
Dutton Creek	90
Elk Basin	730
Ferris	40
Frannie	530
Grass Creek	2,030
Hudson	470
LaBarge	1,190
Lance Creek	280
Lost Soldier	3,100
Lovell	....
Oregon Basin	2,060
Osage	1,220
Rock River	1,950
Poison Spider	220
Simpson Ridge	....
South Casper	....
Teapot	20
Warm Springs	....
Total Wyoming	41,155

MONTANA

Buckley-Border	500
Cat Creek	980
Dry Creek	420
Kevin-Sunburst	4,610
Lake Basin	70
Pondera	1,670
Total Montana	8,250

COLORADO

Florence	380
Fort Collins	1,000
Iles	1,480
Moffat	870
Orchard	350
Rangely	20
Tow Creek	290
Walden	160
Total Colorado	4,550

NEW MEXICO

Rattlesnake	950
Hogback	510
Table Mesa	80
Artesia	991
Cap Rock	187
Getty	195
Hobbs	38,179
Jal	1,012
Lea City	2,450
Eunice	452
Total New Mexico	45,006
Total	98,961
Total previous week	97,257
Difference	1,704

NORTH AND WEST TEXAS

(Continued from Page 28)

1,667,000 feet of gas, total depth 3,051 feet.

Howard-Glasscock Production

Following is Umpire Andrews' statement showing the number of wells, pipe line runs in June from each producing company, with total production from the beginning up to June 30, inclusive, in the Chalk, Roberts, Settles, Phillips and Cofee Pools in Howard and Glasscock Counties:

Company—	No. of wells	June runs	Total 34½ mos.
Amerada Pet. Co.	18	38,360	1,505,412
American Maracaibo	13	30,761	1,528,199
California Co.	18	38,906	920,607
Chalk M. & O.	6	1,538	12,824
Comet Pet. Co.	3	545	7,890
Continental Oil Co.	93	132,044	3,088,971
Cranfill-Reynolds	2	4,140	127,224
Cosden Oil Co.	3	4,113	423,817
Dunigan and Hyer	4	2,169	19,205
Empire Gas & Fuel	4	1,795	10,900
F. H. E. Oil Co.	2	199	2,133
Godley Oil Co.	11	2,799	37,751
Goodwin, P. V.	1	1,209	8,411
Green Prod. Co.	6	4,896	90,105
Gulf Prod. Co.	14	6,854	70,481
Howard Oil Corp.	3	6,089	546,120
Humble Oil Co.	10	19,896	587,214
Hyer and Yates	4	2,407	32,896
Kirby Oil Co.	8	55,818	670,585
La. Oil & Ref. Co.	2	3,913	390,054
Lion Oil Co.	5	14,823	302,782
Lockhart Co.	7	1,126	11,324
Magnolia Pet. Co.	69	41,873	3,124,102
Merrick-Bristow	19	9,321	1,190,477
Merrick-Lamb	17	6,318	67,175
Moody Oil Co.	51	79,442	2,714,943
Owen-Slown-Cosden	14	35,098	1,999,216
Plymouth Oil Co.	8	27,171	990,915
Pure Oil Co.	16	5,230	73,327
Schermerhorn Oil Co.	18	82,545	2,651,401
Shell Pet. Co.	12	45,615	1,024,066
Simms Oil Co.	8	52,916	552,624
Simms and Green	2	1,615	106,685
Smith, E. L., Oil Co.	3	12,925	238,556
Sprague Oil Co.	3	1,665	293,834
Stanolind Oil Co.	9	5,600	47,804
Sun Oil Co.	11	39,492	1,758,336
Taylor Link Oil	2	3,145	136,671
Tidal Oil Co.	2	581	5,283
Ward Oil Co.	21	44,481	1,163,278
Weekly Oil Co.	5	1,477	13,476
Witherspoon-Glass	3	3,215	250,017
World Oil Co.	2	655	8,132
Total	530	871,784	27,795,217

NORTH TEXAS PRODUCTION

Week Ending July 4

Panhandle district—	
Carson County	5,753
Gray County	46,589
Hutchinson County	12,326
Moore County	1,766
Wheeler County	358
Total production this week	66,792
Total production last week	60,064
Increase	6,728
Wichita Falls district—	
Archer County	13,693
Baylor County	480
Clay County	729
Cooke County	1,868
Foard County	76
Haskell County	22
Jack County	2,090
Montague County	3,544
Throckmorton County	396
Wilbarger County	13,053
Wichita County	19,133
Young County	12,877
Total production this week	67,961
Total production last week	67,066
Increase	895
Ranger district—	
Brown County	3,449
Callahan County	2,235
Coleman County	1,700
Comanche County	805
Palo Pinto County	300
Eastland County	3,093
Shackelford County	3,732
Stephens County	4,380
Total production this week	19,694
Total production last week	19,705
Decrease	11

WEST TEXAS PRODUCTION

Week Ending July 4

County—	No. wells	Prod.
Andrews	3	0
Crane	377	14,779
Crockett	51	1,406
Ector	78	5,869
Fisher	11	574
Garza	2	13
Howard-Glasscock	543	28,880
Irion	9	68
Jones	86	1,260
Loving	41	3,756
Mitchell	111	1,871
Pecos	547	70,048
Reagan	255	27,468
Runnels	5	80
Scurry	5	0
Upton	261	5,306
Taylor	3	100
Ward	63	3,024
Winkler	595	42,270
Total production this week		206,772
Total production last week		213,696
Decrease		6,924

WEST TEXAS PRODUCTION

Howard County

Continental Oil Co.'s No. 7 Settles, initial production 800 bbls. on pump, total depth 2,437 feet. (Old well drilled deeper.)

Loving County

Richmond Oil Co.'s No. 1 Russell, top pay 4,264 feet, initial production 90 bbls., total depth 4,264 feet. The California Oil Co.'s No. 3 Allen, top pay 4,280 feet, shot 160 quarts 4,275-4,329 feet, initial pro-

duction 372 bbls., elevation 2,741 feet, total depth 4,331 feet.

Pecos County

Cardinal Oil Co.'s No. 9-C Tippett, top pay 460 feet, initial production 125 bbls., total depth 525 feet.

SHIPMENTS THROUGH TRUNK LINES

Company, size and location—	Bbls.
Gulf, 10-inch, Ranger	24,290
Humble, 2-8-inch, San Angelo	30,922
Humble, 10-12-inch, Comyn	47,202
Illinois, 2-8-inch, Del Rio	26,300
Magnolia, 8-inch, De Leon	12,000
Pasotex, 8-inch, El Paso	8,916
Shell, 10-inch, Healdton	21,798
Shell, 10-inch, Houston	13,163
The Texas Co., 12-inch, Houston	24,135
Total	198,726

SHIPMENTS TO REFINERIES

Big Spring Ref. Co., Big Spring	890
Burford Ref. Co., Pecos	4,312
Cosden Ref. Co., Big Spring	8,414
Col-Tex Ref. Co., Colorado	8,290
Great Western Ref. Co., Big Spring	2,051
Tonkawa Ref. Co., Pyote	1,536
Wickett Ref. Co., Wickett	260
Total	25,753

SHIPMENTS BY TANK CAR

Shell Pet. Corp. from McCamey	417
Big Lake from Texon	4,500
Southern Crude from Wickett	2,524
Total	7,441
Total daily average production	249,523
Total daily average distribution	231,920
Daily average to storage	17,603

INSTITUTE TO CONTINUE RESEARCH DEVELOPMENT

Plans for continuation for two years, but on a smaller scale, of the five-year program in fundamental research in petroleum which ended July 1 last, have been announced by the American Petroleum Institute.

The sum of $75,000, already largely subscribed by several oil companies, will make possible further studies of petroleum occurrence, recovery and composition through Projects Nos. 4, 37 and 6. Some $115,000 already has been invested in these three projects out of the $100,000 contributed annually during the past five years by John D. Rockefeller and the Universal Oil Products Co. At the end of the two years it is hoped to raise funds sufficient to finance a resumption of the complete program.

Project No. 4, "Origin and Environment of Source Sediments of Petroleum," has as its object ascertaining the characteristics of source beds of petroleum. The first phase of the investigation, covering a study of the conditions under which source sediments are now accumulating beneath the sea, has been completed after five years of work by Dr. Parker D. Trask. The second phase, investigation of possible sources of material in petroleum rocks of past geologic age in the vicinity of present production fields, now will be undertaken.

Project No. 37, "Fundamentals of the Retention of Oil by Sand," represents a search for information as to the physical properties of oil-gas mixtures under pressures as high as 3,000 pounds, information necessary to planning a scientific development program. This work has been under way for about three years under the direction of Dr. Robert A. Millikan, of the California Institute of Technology.

Project No. 6, "The Separation, Identification and Determination of the Constituents of Petroleum," deals with the composition of petroleum, present information being woefully inadequate. The work is being done under the direction of Dr. E. W. Washburn, of the United States Bureau of Standards, who has developed technique and much expensive apparatus, and is conducting operations at the bureau on a 24-hour basis and rapidly producing results.

NO RIGHT TO DRILL ON RAIL RIGHT OF WAY

AUSTIN, Tex., July 6.—Right of way grants by the United States and Texas Governments to the Texas & Pacific Railway were merely easements and did not include title to the land or ownership to oil and minerals beneath the land, Judge J. D. Moore held in ninety-eighth district court of Travis County.

Judge Moore sustained the suit by Atty. Gen. James V. Allred against the railroad for title to part of the right of way used by the company in Ector County and upheld the State's claim to the oil that may be produced from the rights of way of such land-grant railroads. The court held the land and its minerals belong to the State, that the railroad had no right to drill oil wells on the land.

Attorney General Allred contended that the road had not been given title to the land by the United States, and that any attempt by the United States to have conferred title was void.

NEW GASSER IN MEXICO

MONTERREY, Mexico, July 2.—The flow of gas in the well which the Ohio-Mexico Oil Co. completed recently near La Presa, state of Nuevo Leon, has been gauged at 12,000,000 feet daily.

Other wells will be drilled by the company in the same locality for the purpose of developing a gas supply for Monterrey and other cities and towns of this part of Mexico, it was stated. At present Monterrey is being supplied with natural gas by the Compania Mexicana de Gas, S.A., subsidiary of United Gas Co., through a pipe line that runs from Zapata County, Texas. It is provided, however, in the contract between the company and the Mexican government that the company is obligated to use gas produced in Mexico whenever the supply shall be sufficient for the purpose.

WILDCAT OPERATIONS IN WEST TEXAS

(Continued from Page 28)

FISHER COUNTY

Stanolind Oil & Gas Co.'s No. 2 Steele, 1,200 ft. E and 330 ft. N of SW cor. Sec. 210, B.B.B.&C. Sur. ..... Top lime 1,600 ft.; good show oil 3,188-90 ft.; to drill in.

The Texas Company's No. 1 Jean, 380 ft. from E and 400 ft. S of Sec. 201, Blk. 1, B.B.B.&C. Sur. ..... Drlg. 2,937 ft.

GAINES COUNTY

Landreth Prod. Co.'s No. 1 Alley, 660 ft. from N and W of Sec. 2, Blk. A-30, P.S.L. Sur. ..... Rainbow show oil 2,965-75 and 3,030-45 ft.; 100,000 ft. gas at 4,306 ft.; hut sdown 4,312 ft.

Texas Consolidated Oil Co. et al's No. 1 Jones, 2,310 ft. from NE Sec. 4, Blk. A-8, P.S.L. Sur. ..... Total depth 4,680 ft. (corrected).

GARZA COUNTY

Pandem Oil Corp.'s No. 1 Justice, 330 ft. from S and W of Sec. 12, Blk. 4, H.&G.N. Sur. ..... Spudded and shut down.

Penny & Posey's No. 1 Justice, 1,980 ft. from S and 1,650 ft. from E of Sec. 25, Blk. 6, H.&G.N. Sur. (3,500-ft. cable tool test) ..... Fishing casing 3,202 ft.

HOWARD COUNTY

Green O. & R. Co.'s No. 1 Denman, 990 ft. from S and 2,310 ft. from W Sec. 14, Blk. 20, Twp. 1s, T.&P. Sur. .. Spudded and shut down.

HUDSPETH COUNTY

Henshaw's No. 1 Love, C NE Sec. 9, Blk. 67½, P.S.L. Sur. ..... Drlg. 585 ft.

Patillo & Welch's No. 1 Briggs, 300 ft. from S and W Sec. 13, Blk. 73, Twp. 7, T.&P. Sur. ..... Shut down 690 ft.

Theison's No. 1 University, 3,050 ft. from S and 2,225 ft. from E of Sec. 17, Blk. E ..... Spudded 35 ft. and shut down.

IRION COUNTY

Davis et al's No. 1 Suggs, 1,560 ft. from S and 925 ft. from W Sec. 3,081, Blk. 28, H.&T.C. Sur. ..... Drlg. 1,584 ft.

Danny & Andrews' No. 1-A Tankersley, 200 ft. from S and 3,000 ft. from E of Sec. 709, J. P. Imhoff Sur. .. Rigged up.

Ellis et al's No. 1 Nutt, 1,350 ft. from N and 450 ft. from E of Sec. 694, Kreikenbohm Sur. ..... Location.

Stanolind Oil & Gas Co.'s No. 1 Williams, 1,320 ft. from S and E of Sec. 1,196, T.T.R.R. Sur. ..... 300 ft. oil in hole from 4,155-63 ft.; hsut down 5,950 ft.

Fox's No. 1 Horney, 1,520 ft. from N and 1,525 ft. from W Sec. 2, Blk. 3, H.&T.C. Sur. ..... Shut down 1,503 ft.

Straughn & Texannati Oil Co.'s No. 1 Tankersley, 150 ft. from S and 750 ft. from W of Sec. 4, Gonzales County School Land ..... Plugged back to 1,283 ft.; total depth 1,506 ft.

Straughn & Adkins Bros.' No. 1 Lee, 1,080 ft. from W and 420 ft. from N of Sec. 729, C. Kaiser Sur. ..... Spudded 7-2-31.

JONES COUNTY

Abers et al's No. 1 Burton, 150 ft. from S and 175 ft. from E of 43.4-acre tract in G. Martinez Sur. ..... Shut down 1,140 ft.

Barney & Duffy's No. 2 King, 3,700 ft. from N and 200 ft. from E, Subd. No. 18, M. Bueno Sur. ..... Rigged up.

Union Oil Co.'s No. 2 King, 4,100 ft. from N and 200 ft. from E, Subd. 18, Bueno Sur. ..... Shut down 2,098 ft.

LOVING COUNTY

Adams et al's No. 1 Wichmann, 330 ft. from NE and 2,310 ft. from SE of Sec. 84, Blk. 1, W.&N.W. Sur. .... Drlg. 3,033 ft.

Ervin & Mahres' No. 1 Thrope, 2,310 ft. from E and 330 ft. from S Sec. 46, Blk. 53, T.&P. Sur. ..... Shut down 810 ft.

Slack's No. 1 Lynd, 990 ft. NE and 330 ft. SE of Sec. 3, Blk. 2, W.&N.W. Sur. ..... Drlg. 75 ft.

Eppenauer et al's No. 1 Johnson, 330 ft. from NW and SW of Sec. 86, Blk. 1, W.&N.W. Sur. ..... Total depth 210 ft.; running 12½-in. casing.

Falbre & Evans' No. 1 Dean, 330 ft. from NE and 990 ft. from NW Sec. 79, Blk. 33, H.&T.C. Sur. ..... Drlg. 2,362 ft.

Hoffman et al's No. 2 Ramsey et al, 2,310 ft. from NE and 330 ft. from SE Sec. 83 ..... Total depth 4,219 ft.; cleaning out; est. 120 bbls. oil per day; top pay 4,205 ft.

Lockhart & Co.'s No. 2 Bowen & Wells, 330 ft. from NE and SE of Sec. 92, Blk. 1, W.&N.W. Sur. ..... Shut down 4,050 ft.

Martin et al's No. 2 Ramsey, 990 ft. from SE and 2,310 ft. from SW Sec. 83, Blk. 1, W.&N.W. Sur. ..... Drlg. 2,584 ft.

Rush et al's No. 1 Wheat, 330 ft. from NW and SW Sec. 77, Blk. 1, W.&N.W. Sur. ..... Cellar.

Slagel Drlg. Co.'s No. 1 Cartwright et al, 2,310 ft. from S and 990 ft. from W Sec. 1, Blk. 57, Twp. 1, T.&P. Sur. ..... Total depth 3,182 ft.; top pay 3,175-80 ft.; to shoot lower pay.

W. A. Suddreth et al's No. 1 Capitola Pool, 2,970 ft. from NE and 990 ft. from NW Sec. 73, Blk. 33, H.&T.C. Sur. ..... Elev. 2,644 ft.; shut down 850 ft.

Tennant et al's No. 1 Martin, 990 ft. from NW and SW Sec. 66, Blk. 1, W.&N.W. Sur. ..... Shut down 1,400 ft.

MENARD COUNTY

Priest's No. 1 Sorrell, 1,000 ft. from E and 200 ft. from S cor. Sec. 132, E.L.R.R. Sur. ..... Shut down 2,860 ft.

PECOS COUNTY

Dittman's No. 1 Sanford, 330 ft. from NW and 1,650 ft. from NE of Sec. 55, Blk. 10, H.&G.N. Sur. ..... Location.

Honolulu Oil Co.'s No. 1 Webb, 3,140 ft. from N and 1,000 ft. from W of Sec. 105, Blk. OW, G.C.&S.F. Sur. .. Drlg. 2,710 ft.

J. R. Miller et al's No. 1 Bennett, 359 ft. W of CWL Sec. 1, Blk. 119, G.C.&S.F. Sur. ..... Shut down 2,283 ft. for casing.

Perren Oil Co.'s No. 2 Eaton, S of E Sec. 27, Blk. 3, H.&T.C. Sur. ..... Fishing 1,765 ft.

Pure Oil Co.'s No. 1 Harrison, 2,310 ft. from N and 330 ft. from W of Sec. 203, Blk. 3, T.&P. Sur. ..... Shut down 5,000 ft.

Whitaker et al's No. 1 Mary Devlin, 150 ft. from N and 150 ft. from E Sec. 69, F. Hernandez Sur. ..... Shut down 430 ft.

REEVES COUNTY

R. T. Hansford's No. 1 Williams, 150 ft. from S and W Sec. 17, Blk. 6, H.&G.N. Sur. ..... Shut down 580 ft.

Humble Oil & Ref. Co.'s No. 1 Bolmorhea Livestock Co., 1,320 ft. from N and 1,320 ft. from W Sec. 33, Blk. 5, H.&G.N. Sur. ..... Drlg. 2,030 ft.

Lee O. White et al's No. 1 Hershersor, 330 ft. from N and W lines of Sec. 5, Blk. 51, Twp. 10, T.&P. Sur. .... Fishing bit 4,730 ft.

RUNNELS COUNTY

Dutton et al's No. 1 Dean, 5,475 ft. from NE and 1,048 ft. from NW in J. Heil Sur. No. 519 ..... Shut down 2,335 ft.; fishing tools at 2,180 ft.

SCHLEICHER COUNTY

Eastland Oil Co.'s No. 1 Joe Tisdale, C Sec. 29, Blk. M, G.H.&S.A. Sur. ..... Fishing pipe 2,522 ft.

Wesner et al's No. 1 Nicks, 2,310 ft. from N and 2,362 ft. from E of Sec. 77, Blk. LL, T.C. Sur. ..... Top pay 4,000 ft.; shut down 4,006 ft.; approximately 1,000 ft. fluid in hole.

George Wilson's No. 1 Page, Sec. 40, Blk. L, 1,290 ft. from N, 1,570 ft. from W, G.H.&S.A. Sur. ..... Shut down 5,053 ft.

SCURRY COUNTY

G. E. Dickman and R. B. Pender et al's No. 1 F. C. Davis, 1,000 ft. N and 1,770 ft. W of SE cor. of Sec. 275, Blk. 2, H.&T.C. Sur. ..... Shut down 5,100 ft.

Scurry County Oil Exchange's No. 1 Earnest, 2,310 ft. from N and W Sec. 68, Blk. 3, H.&G.N. Sur. ..... Spudded and shut down.

Seifert & Di' bie's No. 1 T. M. Blackburn, 2,310 ft. from N and 2,310 ft. from W line of Sec. 153, Blk. 97, H.&T.C. Sur. ..... Shut down 3,390 ft.

Simon & Brock et al's No. 1 Cruse, 2,310 ft. from S and E Sec. 119, Blk. 97, H.&T.C. Sur. ..... Drlg. 2,935 ft.; show oil 1,798, 1,820, 1,850 ft.

TERRELL COUNTY

Big Bend Oil Co.'s No. 1 Bassett, C NW Sec. 155, Blk. D, M.-K.-T. Sur. ..... Shut down 2,669 ft.

Keck Pecos Trust Co.'s No. 1 Hamilton, C Sec. 6, Georgetown Ry. Sur. ..... Shut down 3,150 ft.

Miller Bros.' No. 1 Allison & Burke, C NW cor. Sec. 10, Blk. 176, T.&P. Sur. ..... Shut down 120 ft.

Mid-Kansas Oil & Gas Co.'s No. 1 Goode, 2,152 ft. from E and 330 ft. from S Sec. 26, Blk. 161, G.C.&S.F. Sur. .. Shut down 6,120 ft.

Jones et al's No. 1 Pankenham, C SE NW Sec. 43, Blk. B-2, C.C.S.D.&R.G.N.G. Sur. ..... Top lime 1,690 ft.; shut down 2,240 ft.

TOM GREEN COUNTY

Belding & Dutton's No. 1 Norsworthy, 2,640 ft. from S and 587 ft. from E of John McNeese Sur. ..... Shut down 760 ft.; show oil and gas 725 ft.

Mintex Oil Co.'s No. 1 Campbell Est., 446 ft. from S and 630 ft. from W of Sec. 180, Dist. No. 11, S.P. Sur. .... Shut down 1,994 ft.

Pratt & Hancock's No. 2 Lewis, 100 ft. N and 330 ft. E of most northerly SW cor. of Joshua S. Grant Sur. No. 2 ..... Shut down 200 ft.

UPTON COUNTY

Mintex Oil Co.'s No. 1 Lane, 2,310 ft. from N and 1,650 ft. from W Sec. 36, Blk. 1, M.-K.-T. Sur. ..... Shut down 2,237 ft.; 200 ft. oil in hole from 2,220 ft.

Rankin et al's No. 1 Cordova Union Land, 660 ft. from N and E Sec. 6, G.C.&S.F. Sur., 1¼ miles S of Rankin ..... Elev. 2,615 ft.; drlg. 1,060 ft.

VAL VERDE COUNTY

Independent Operators' No. 1 Whitehead, SE SE Sec. 10, Blk. 4, I.&G.N. Sur., elev. 1,175 ft. ..... Shut down 5,420 ft.

O. O. Owens' No. 1 Mills, Sec. 128, Blk. 1, I.&G.N. Sur., elev. 2,130 ft. ..... Shut down 6,780 ft.

WARD COUNTY

Bradford et al's No. 1 Carson, 990 ft. from NE and SE Sec. 26, Blk. 5, H.&T.C. Sur. ..... Spraying 10 bbls. oil per day from 2,142 ft.; shut down 2,195 ft.

Bradford & Abell's No. 2 Boogher, 1,160 ft. from NW and 800 ft. from SW, Sec. 11, Blk. 5, H.&T.C. Sur. ... Drlg. 1,415 ft.; top salt 770 ft.

Bradford's No. 1 York, 330 ft. from NE and SE of Sec. 10, Blk. 34, H.&T.C. Sur. ..... Drlg. 1,063 ft.; top salt 1,020 ft.

Beckley et al's No. 1 Johnson, 4,140 ft from NE and 990 ft from SE Sec. 8, Blk. 32, H.&T.C. Sur. ..... Cleaning out after 80-qt. shot; cleaned self and flowed 45 minutes; total depth 2,240 ft.

Buster Black's No. 1 Hall & Roberts, 990 ft. from NE and 1,650 ft. from NW Sec. 17, Blk. 32, H.&T.C. Sur... Shut down 1,715 ft.

Central Oil & Gas Co.'s No. 1 Barrow, 330 ft. from NW and 1,363 ft. from SW Sec. 55, J. W. Jackson Sur. ..... Drlg. 762 ft.

Gibson & Johnson's No. 1 Johnson, 4,140 ft. from SE. and 990 ft. from NE Sec. 10, Blk. 32, H.&T.C. Sur.... Shut down 2,503 ft.; to plug.

Gulf Prod. Co.'s No. 8 Hutchins, 2,310 ft. from S and 990 ft. from W of Sec. 3, Blk. F, G.M.M.B&A. Sur. .. Top salt 1,265 ft.; drlg. 1,983 ft.

Hankinson et al's No. 1 Emery, 3,090 ft. from SE and 510 ft. from SW, Sec. 26, Blk. 5, H.&T.C. Sur. ..... Drlg. 1,778 ft.

Moran & Miles' No. 1 Boogher, 3,603 ft. from NE and 1,303 ft. from SE Sec. 11, Blk. 5, H.&T.C. Sur. ..... Drlg. 223 ft.

O'Quinn et al's No. 1 Cummins, 4,300 ft. from NE and 330 ft. from SE of Sec. 11, Blk. 5, H.&T.C. Sur. ..... Drlg. 945 ft.; top salt 800 ft.

Pat Moran's No. 1 Sweatt, 1,470 ft. from SW and 150 ft. from NW Sec. 12, Blk. 5, H.&T.C. Sur. ..... Top pay 2,169 ft.; cleaning out at 2,170 ft.; gauged 35 bbls. in 12 hours.

Peck & Fuglar's No. 1 Merritt, 3,603 ft. from NE and 1,693 ft. from SE Sec. 11, Blk. 5, H.&T.C. Sur. ..... Location.

Rector Oil Co.'s No. 1 Smith, 1,320 ft. from N and E. Sec. 22, Blk. A, G.M.M.B.&A. Sur. ..... Top salt 940 ft.; drlg. plug 1,060 ft.

Shipley et al's No. 5 Hayslett, 2,490 ft. from SE and 1,980 ft. from SW Sec. 17, Bl. 5, H.&T.C. Sur. ..... Shut down 2,520 ft.; 1,500 ft. oil in hole; waiting on tubing.

Simms Oil Co.'s No. 1 Himmel, 330 ft. from NE and 2,310 ft. from SE Sec. 30, Blk. B-29, P.S.L. Sur. ..... Top pay 2,246 ft. and 2,325 ft.; drlg. 2,612 ft.

Sturm's No. 1 Jones, 330 ft. from SW and SE of Sec. 35, Blk. B-29, P.S.L. Sur. ..... Elev. 2,519 ft.; shut down 2,475 ft.; flowing 130 bbls. daily.

Shipley et al's No. 1 Monroe, 330 ft. SE SW Sec. 3, Blk. 1 ..... Shut down 4,545 ft.

White et al's No. 1 Burtner, 150 ft. from NE and 515 ft. from SE of Sec. 8, Blk. 32, H.&T.C. Sur. ..... Rigging up.

WINKLER COUNTY

Liner Drlg. Co.'s No. 1 Campbell, 860 ft. from N and E cor. Sec. 3, Blk. B-5 ..... Shut down 4,640 ft.

WILDCAT OPERATIONS IN TEXAS PANHANDLE

(Continued from Page 28)

Danciger O. & R. Co.'s No. 1 Barnett, 231 ft. S. 330 ft. W, E½ of N 56 ac., Sec. 136, Blk. 3, I.&G.N. Sur.... 5,000,000 ft. gas 3,097 ft; S.D. 3,097 ft.

Parton Holt and Shell Pet. Corp.'s No. 1 Morse, 330 ft. S and E, Sec. 6, Blk. 26, H.&G.N. Sur. ..... Rig.

Jean Pet. Co.'s No. 1 Furneaux Bros., 330 ft. N and W, cor. SE, Sec. 200, Blk. B-2, H.&G.N. Sur. ..... S.D. 2,770 ft; P.B. 2,430 ft. and shot with 80 qts. 2,409-30 ft.; C.O.

Magnolia Pet. Co.'s No. 1 Heaston, NE cor. S½ NE, Sec. 164, Blk. 3, I.&G.N. Sur. ..... Rig on ground.

Nelson et al's No. 1 Crews, 330 ft. S and E, NW, Sec. 13, Blk. 35, H.&G.N. Sur. ..... S.D. 2,619 ft.

Operators Royalty & Prod. Co.'s No. 2 Vanniman, 330 ft. S and W, E½ NE, Sec. 175, Blk. 3, I.&G.N. Sur... T.D. 3,208 ft; 6,000,000 ft. gas 3,150-55 ft; C.O. 3,108 ft.

Pulse-Shell Pet. Corp.'s No. 1 Simpson, SE NE, Sec. 140, Blk. 3, I.&G.N. Sur. ..... Drlg. 2,035 ft.

Steckoll & Reiger's No. 1 Davidson, 660 ft. N and W, Sec. 64, Blk. B-2, H.&G.N. Sur. ..... Drlg. 3,170 ft; 800 ft. oil in hole from 3,150 ft.

Steckoll & Reiger's No. 1 Short, 330 ft. S and W, Sec. 17, B. E. Chaney Sur. ..... S.G. 2,110 ft; drlg. 2,582 ft; 12,500,000 ft. gas.

Sullivan & Ochiltree's No. 1-A Morse, 330 ft. S and W, N¼ NE, Sec. 15, Blk. A-9, H.&G.N. Sur. ..... S.D. 2,626 ft.

Tarber's No. 1 Saunders, 330 ft. N and W, Sec. 3, Blk. 1, B.S.&F. Sur. ..... Location.

HUTCHINSON COUNTY

Danciger O. & R. Co.'s No. 1 Johnson, 330 ft. N and W, SE. Sec. 34, Blk. Y, A.&B. Sur. ..... Spudded and S.D.

Deal O. & G. Co.'s No. 2 Sanford, 330 ft. N and E of N 80 ac., S 160 ac., Sec. 31, Blk. 46, H.&T.C. Sur. .. S.D. 450 ft.

Huber Prod. Co.'s No. 1 Johnson Bros. (Premier), 330 ft. N and E of W 60 ac., N 80 ac., NW, Sec. 3, Blk. Y, A.&B. Sur. ..... Big gas 2,330 ft. and 2,395 ft.; S.O. 2,974 ft; S.D. 3,016 ft.

Liner et al's No 1 Johnson Bros., 990 ft. S, 330 ft. E, W½ SE, Sec. 29, Blk. Y, A.&B. Sur. ..... Spudded and S.D.

Skelly Oil Co.'s No. 1 Johnson Bros., 660 ft. S and W, SE, Sec. 30, Blk. Y, A.&B. Sur. ..... S.D. 3,115 ft.

Stanolind O. & G. Co.'s No. 2-B Pitcher, 990 ft. S, 330 ft. E, W½ SW, Sec. 19, Blk. M-21, T.C.R.R. Sur. .... Bldg. rig.

Timms-Deatch's No. 4 Moore, 330 ft. N and W, Sec. 124, Blk. 4, I.&G.N. Sur. ..... Rig.

LIPSCOMB COUNTY

Okla. Public Service Co.'s No. 1 C. W. Jones, NE SW, Sec. 100, H.&T.C. Sur. ..... T.D. 5,003 ft.

LUBBOCK COUNTY

Center Oil Co.'s No. 1 Bowles Ranch..... Small S.O. 1,133-40 ft; S.D. 4,167 ft.

MOORE COUNTY

Cloud & Dana's No. 1 Jones, 330 ft. N and E, SW, Sec. 169, Blk. 3-T, T.&N.O. Sur. ..... T.D. 3,471 ft; S.O. 3,465-69 ft; plugged back to 3,470 ft; swbd. 37 bbls. in 24 hrs.

Interstate's No. 1 Nield, C NE, Sec. 18, Blk. 44, H.&T. C. Sur. ..... Location.

Magnolia Pet. Co.'s No. 1 Jones, 330 ft. N, 330 ft. E, Sec. 170, Blk. 3-T, T.&N.O. Sur. ..... Drlg. 2,415 ft.

Pollard et al's No. 1 Hall, 330 ft. S and E, NE, Sec. 131, Blk. 3-T, T.&N.O. Sur. ..... Rig on ground.

Sunray Oil Co.'s No. 1 Rupert, 660 ft. N, 330 ft. E, NW, Sec. 191, Blk. 3-T, T.&N.O. Sur. ..... Cellar.

Sunray Oil Co.'s No. 2 Jones, 330 ft. N and W, W½ SW, Sec. 164, Blk. 3-T, T.&N.O. Sur. ..... Rig on ground.

Texas Interstate P. L. Co.'s No. 1-23 Thompson, C N½ NE, Sec. 23, Blk. 44, H.&T.C. Sur. ..... Location.

Texas Interstate P. L. Co.'s No. 1-33 Sneed, C SW, Sec. 33, Blk. 6-T, T.&N.O. Sur. ..... Drlg. 1,430 ft.

Texas Interstate P. L. Co.'s No. 1-37 Sneed, C NW, Sec. 37, Blk. 6-T, T.&N.O. Sur. ..... Location.

Texas Interstate P. L. Co.'s No. 2-55, C SE, Sec. 55, Blk. 6-T, T.&N.O. Sur. ..... Drlg. 2,192 ft.

MOTLEY COUNTY

Matador Oil Corp.'s No. 1 Owens, C NE, Sec. 10, Blk. G, B.&B. Sur. ..... S.D. 530 ft.

OLDHAM COUNTY

Amalgamated German-American Oil Corp.'s No. 1 Norton, 330 ft. S and E, Sec. 12, T.&N.O. Sur. ..... S.D. 400 ft.

Chambers et al's No. 1 Herring, CNL, Sec. 20, Blk. S, G.C.&S.F. Sur. ..... S.D. 800 ft.

ROBERTS COUNTY

Chicken Creek Oil Co.'s No. 1 Ledrick, 330 ft. N and W, Sec. 55, Blk. C, G.&M. Sur. ..... Fishing 850 ft.

Travis et al's No. 1 Cunningham, 330 ft. S and W, Sec. 74, Blk. M-2, H.&G.N. Sur. ..... S.D. 2,650 ft.

WHEELER COUNTY

Clarity et al's No. 1 Porter, 330 ft. S and W, SE, Sec. 2, Blk. A-9, H.&G.N. Sur. ..... Drlg. 903 ft.

EAST CENTRAL TEXAS WILDCATS

(Continued from Page 25)

FREESTONE COUNTY

Raley and Clark's No. 1 McLancaster (Pampler), 150 ft. from E of W line and center of N and S line, S. Avant Sur. ..... Moving in rig.

E. L. Smith's No. 1 Emily Jackson, center of N 150 acres of 300-ac. Emily Jackson tract ..... Fishing for drill stem 3,136 ft.

GREGG COUNTY

Abernathy et al's No. 1 L. A. Rodden, 630 ft. from N and 320 ft. from E lines of Martha Dillard Sur.. Derrick.

Alice Royalty Co.'s No. 1 A. N. King, 553 ft. from E and 165 ft. from S lines of 24-ac. tract in G. A. Thomason Sur. ..... T. D. 3,631 ft.

Amerada Petroleum Corp.'s No. 1 W. E. and Catie N. Bumpas, 350 ft. from S and E lines of 100-ac. tract in W. H. Castleberry Sur. ..... Top sand 3,539 ft.; T. D. 3,569 ft.

O. O. Alford et al's No. 1 L. M. Colburn, 208 ft. from N and 392 ft. from E of 39.7-ac. tract, Henry Hobson Sur. ..... Top Pecan Gap 2,390 ft.

Arkansas Drlg. Co.'s No. 1 S. Dodson, 150 ft. from E and 150 ft. from S of lease and survey, Allen Norris Sur. ..... Top sand 3,631 ft.; set csg. 3,625 ft.

Arkansas Fuel Oil Co.'s No. 1 J. H. and Jim Whitaker, 330 ft. from S and W lines of 106-ac. tract in C. H. Alexander Sur. ..... Drlg. 1,665 ft.

Atlantic Prod. Co.'s No. 1 J. J. Fuller, 394 ft. from E and 342 ft. from S of 50-ac. tract and lease, Mowery Irwin Sur. ..... Derrick.

Armstrong and Pitts' No. 1 Walker, 940 ft. from N and 1,970 ft. from E of survey, Martha Dillard Sur. ..... Derrick.

P. P. Ash et al's No. 1 A. H. Tubbs, 1,550 ft. from S and 4,120 ft. from E of survey, Dolores Sanches Sur. ..... Derrick.

Badgett and Ward's No. 1 Sample, 655 ft. S and 185 ft. W of SW cor. of A. Z. Jeffery 29.5 acres, W. P. Chisum Sur. ..... Shut down 1,300 ft. for drill pipe

Becker et al's No. 1 J. C. Barrett, 330 ft. from S and W lines of N 100 acres of 320-ac. tract in G. W. Hooper Sur. ..... Shut down 2,500 ft.

Barnsdall Oil Co.'s No. 1 Ladd Smith, 360 ft. from N and 150 ft. from W line of survey, J. S. Carrithers Sur. ..... Location.

Barnsdall Oil Co.'s No. 1 G. E. Adams, 1,150 ft. from S and 3,720 ft. from W of G. W. Hooper Sur. ..... Derrick.

Bob et al's No. 1 T. L. Broy, 390 ft. from E and 1,640 ft. from S of H. A. Hoidt Sur. ..... Location.

Byrd-Frost, Inc.'s No. 1 J. R. Watson, center of 5-ac. lease, 1,500 ft. from E and 2,250 ft. from S lines of survey, J. S. Carrithers Sur. ..... Top Austin chalk 3,542 ft.; set 6⅝-in. csg.; T. D. 3,550 ft

M. T. Beeler's No. 1 Finley and Thomas, 150 ft. from N and 150 ft. from W of 10-ac. lease, C. H. Alexander Sur. ..... Building derrick.

Branson et al's No. 1 J. J. Fuller, 1,050 ft. from N and 170 ft. from W of survey, M. Alexander Sur. ... Derrick.

C. A. Bryan's No. 1 C. Vernon, 1,240 ft. from E and 151 ft. N of SW cor. of C. Vernon 58.75-ac. tract, W. W. Avery Sur. ..... Derrick.

Bell & Graddy's No. 1 M. George (or Daniels), 225 ft. S and 650 ft. W of 26-ac. tract, Mary Van Winkle Sur. ..... On fire; T. D. 3,580 ft.

B. L. Brooklin's No. 1 J. M. Tittle, 150 ft. from N and 205 ft. from E of 12½-ac. lease, William H. Castleberry Sur. ..... Shut down 2,800 ft.

Callahan, Thompson et al's No. 1 Fenn, 462 ft. from N and 150 ft. from E, 778 ft. from S of 44.5-ac. tract, David Ferguson Sur. ..... Oil sand 3,603-40 ft.; preparing to test.

Callahan et al's No. 2 Mollie Fenn, 450 ft. from S and 150 ft. from W lines of 44-ac. tract in D. Ferguson Sur. ..... Derrick.

Columbia Oil & Gas Co.'s No. 1-A Harley, 650 ft. E and 300 ft. S of SE cor. of Laura Walker 45-ac. tract, William Robinson Sur. ..... Moving in rig.

Continental Oil Co.'s No. 1 J. J. Flewellen, 350 ft. from N and 949 ft. from E of 200-ac. lease, Marshall Mann Sur. ..... Location.

Davis and Russell's No. 1 M. E. Anderson, 150 ft. from E and 75 ft. from S of 3-ac. lease in Kilgore Townsite, Mary Van Winkle Sur. ..... Shut down 3,558 ft.

Charles Davidson et al's No. 1 Paul Jones, 7,000 ft. from most southerly N line and 3,600 ft. from W, W. P. Chisum Sur. ..... Shut down 3,666 ft.

Duffey-Davis and McGrede's No. 1, 1,310 ft. from N and 3,160 ft. from E of survey, Martha Dillard Sur. ..... Rig up.

Eastland Oil & Gas Co.'s No. 1 B. B. Sparks, 150 ft. from N and 150 ft. from W of E 50 acres of 100-ac. tract, Harvey R. Kirk Sur. ..... Derrick.

Empire Gas & Fuel Oil Co.'s No. 1 Mrs. L. J. Rogers, 330 ft. from N and E lines of 66.5-ac. tract in George A. Thomason Sur. ..... Location.

Dr. J. C. Falvey et al's No. 1 fee, 150 ft. from S and 150 ft. from W of 55-ac. tract, Marshall Mann Sur. ..... Skid rig.

Greer's No. 1 L. M. Colburn, 150 ft. from E and 150 ft. from S of 45-ac. lease, 5,700 ft. from E and 850 ft. from N of survey, Henry Hathaway Sur. ..... Rig up.

Gulf Production Co.'s No. 1 Willie Holt, 150 ft. from N and 1,700 ft. from E lines of John Blair Sur. .... Set 10-in. csg. at 171 ft.

Harper Petroleum Corp.'s No. 1 Woodley Jones, 2,000 ft. from N line and 3,900 ft. from E line of William H. Castleberry Sur. ..... Derrick.

Gulf Production Co.'s No. 1 T. C. Reeves et al, 175 ft. from S and 525 ft. from W lines of lease in G. F. Penn Sur. ..... Rig up.

Howard and Russell's No. 1 Stone, 150 ft. from N and 150 ft. from E of 100-ac. tract, Bailey Anderson Sur. ..... Derrick.

Humble Oil & Refining Co.'s No. 1 W. W. Holland, 150 ft. from E and 336 ft. from S lines of 246-ac. tract in M. Mosley Sur. ..... Drlg. 90 ft.

Humble Oil & Refining Co.'s No. 1 R. M. Lawrence, 540 ft. from N and 219 ft. from W of 100-ac. tract, David Ferguson Sur. ..... Moving in material.

Humphrey et al's No. 1 A. Spear, 150 ft. from N and W lines of Spear tract, Mary Van Winkle Sur. ..... Set 6⅝-in. csg. 3,526 ft.

K. B. Oil Co.'s No. 1 Dickson, 150 ft. from S and 150 ft. from W of 5-ac. lease, Mary Van Winkle Sur. ..... Drlg. 2,860 ft.; top Pecan Gap 2,430 ft.

W. R. Jones et al's No. 1 Dovie C. Satterwhite, 200 ft. from S. and 180 ft. from W. of 13½-ac. tract, Mowry Irwin Sur. ..... Drlg. 2,860 ft.

Kimsey-Trimble's No. 1 Griffith Davis, 923 ft. E of N line of Griffith Davis 119.5-ac. tract from NW cor. of same and 145 ft. S at right angles, W. P. Chisum Sur. ..... Drlg. 3,250 ft.

Charles Love et al's No. 1 J. B. Doby, 150 ft. from E and 150 ft. from S of S 6 acres of W 42 acres of 170-ac. tract, W. H. Castleberry Sur. ..... Derrick.

Lion Oil & Refining Co.'s No. 1 C. D. Evans, 254 ft. from N and 254 ft. from S, 350 ft. from W of 16-ac. lease, Pleasant McAnally Sur. ..... Drlg. 1,050 ft.

J. K. Livingston Oil Co.'s No. 1 D. C. Johnson, 200 ft. from N and 150 ft. from E of survey, Martha Dillard Sur. ..... Drlg. 350 ft.

Magnolia Petroleum Co.'s No. 1 O. F. Smith (A. Ramsey), 206 ft. from N and 330 ft. from E lines of 61-ac. tract in H. Edwards Sur. ..... T. D. 3,590 ft. in sand; top Austin 3,507 ft.

Mid-Kansas Oil & Gas Co.'s No. 1 James Moore et al, 150 ft. from S and E lines of most southerly SE cor. of 90-ac. lease in J. Mosley Sur. ..... Derrick.

George L. Pace et al's No. 1 W. D. Anderson, 150 ft. from N and 150 ft. from W of 13¾-ac. tract, G. W. Hooper Sur. ..... Drlg. 3,015 ft.

Pelican Natural Gas Co.'s No. 1 A. Spear and R. H. Laird, 1,650 ft. from N and 147 ft. from E lines of A. Norris Sur. ..... Drlg. 1,800 ft.

Prince and Prince's No. 1 J. Worr, 630 ft. from W of NW cor. of George Hampton Sur., Haden Edwards Sur. ..... Derrick.

Roberts Oil Co.'s No. 1 W. B. Goyne, 150 ft. from S and 150 ft. from W of 14-ac. tract, Mary Van Winkle Sur. ..... Derrick.

Ross et al's No. 1, located on Findley & Thomas 50-ac. tract, 150 ft. from S line of 6.66-ac. lease, C. H. Alexander Sur. ..... Derrick.

C. Rosenfield et al's No. 1 J. A. Knowles, 700 ft. from E. 1,250 ft. from N. William Lyles Sur. ..... Shut down 3,550 ft.

Scheig et al's No. 1 Rube Smith, 1,100 ft. N and 300 ft. from W of tract and survey, Slaughter Sur. .... Derrick.

Selby Oil & Gas Co.'s No. 1 M. T. Cole, 150 ft. from N and 300 ft. from E lines of lease in J. M. Meador Sur. ..... Location.

Sneed and Worley's No. 1 Lillie Willis, 300 ft. from E and 400 ft. from S of 13.57-ac. tract, G. W. Hooper Sur. ..... Drlg. 2,680 ft.

Sinclair Oil & Gas Co.'s No. 1 M. T. Cole, 2,640 ft. from N and 2,742.2 ft. from W line of survey, Samuel Brooks Sur. ..... Cleaned out and on open gauge; T. D. 3,681 ft.

Sinclair Oil & Gas Co.'s No. 1 John R. Williams, 250 ft. from N and 250 ft. from W lines of 36.4-ac. tract in W. L. Wilburn Sur. ..... Set 6⅝-in. csg. 3,471 ft.; top Austin chalk 3,450 ft.

Sun Oil Co.'s No. 1 J. W. Akin, 330 ft. from N and W lines of 25.68-ac. tract in George A. Thomason Sur. ..... Location.

Sun Oil Co.'s No. 2 G. W. Tate, 250 ft. from N and 360 ft. from W of 64-ac. tract, W. H. Castleberry Sur. ..... Top sand 3,513-45 ft.; connecting up.

Sun Oil Co.'s No. 1 J. T. Loden, 150 ft. from S and 160 ft. from W of 100-ac. tract, Dolores Sanches Sur. ..... Coring 3,637 ft.

Sun Oil Co.'s No. 1 Pentecost, 150 ft. from S and 150 ft. from W of lease, Mary Scott Sur. ..... Run 6⅝-in. csg. 3,598 ft.

Superior Oil Co.'s No. 1 L. C. Ingram, 200 ft. from E and 167 ft. from S of 160-ac. tract in W. E. Postelle Sur. ..... Drlg. 325 ft.

C. S. Thomas et al's No. 1 C. B. Everett, 300 ft. from N and 200 ft. from E of 30.25-ac. tract, John Ruddle Sur. ..... Drlg. plug.

The Texas Company's No. 1 J. B. Bales, 330 ft. from S and 150 ft. from W of 30-ac. tract, William Carlton Sur. ..... Top sand 3,522 ft.; T. D. 3,586 ft.

L. C. Thorpe's No. 1 J. A. Butts, 4,850 ft. S of N and 5,300 ft. E of W line of survey, Mary Van Winkle Sur. ..... Derrick.

Tidal Oil Co.'s No. 1 Lake Divernia Fish and Game Club, 300 ft. from N and 550 ft. from W lines of tract in William G. Painter Sur. ..... Location.

Vacuum Oil Co.'s No. 1 R. S. White, 350 ft. from S and W lines of 82-ac. tract in D. Moore Sur. ..... Drlg. 2,000 ft.

Valentine Oil Co.'s No. 1 Goyne-Hughey, 6,100 ft. from S and 6,800 ft. from W of survey, Mary Van Winkle Sur. ..... Derrick.

H. M. Wages et al's No. 1 Finley and Thomas, 165 ft. from E and 150 ft. from S of 10-ac. lease, Charles H. Alexander Sur. ..... Shut down 3,200 ft.

Woodley Petroleum Co.'s No. 1 Dyers, 200 ft. from S and 200 ft. from W of 640-ac. lease, H. Hathaway Sur. ..... Derrick.

Ziegler Oil Co.'s No. 1 L. D. Campbell, 540 ft. from N and 219 ft. from E of 72½-ac. tract, David Ferguson Sur. ..... Derrick.

HENDERSON COUNTY

Westside Investment Co.'s No. 1 Thornhill, 450 varas from W and 400 varas from N line of survey, James Spivey heirs Sur. ..... Shut down 4,850 ft.

HOPKINS COUNTY

Thelma Wells' No. 1 Taylor, 220 ft. from N and W lines of 80-ac. tract in the John Polk Sur. ..... Derrick.

HOUSTON COUNTY

N. E. Irish's No. 1 Mrs. Byrdie Watters, 2,300 ft. W and 300 ft. S from the NE cor. of L. J. Ellis Sur. ... Rig up.

Ramsland and Ramsland's No. 1 Pennington, 750 varas W of E line and 500 varas from S line of survey on 186-ac. tract, Ramond LaGarsa Sur. ..... Drlg. 200 ft.

Phillips and Phillips' No. 1 Kennedy Bros., 485 varas out of SW cor. of 100-ac. tract, Jose M. Procella Sur. ..... Derrick.

LAMAR COUNTY

Indian States Oil Co.'s No. 1 W. T. Watson in Ignalius Aud Sur. ..... Location.

Puritan's No. 1 George Parr, 2,000 ft. from W of Frisco Railway and 1,000 ft. from E line of R. Russell Sur. ..... Ready to spud.

LEON COUNTY

Cooper et al's No. 1 Lynch, 4,000 ft. from the W line and 250 ft. N from the S lines of Thomas H. Gardner Sur., and in 200-ac. tract ..... Rig up.

LIMESTONE COUNTY

George McCamey's No. 1 B. K. Arnett, center of Blk. 13 in Casson Townsite ..... Shut down 1,720 ft.

MORRIS COUNTY

Dumas et al's No. 1 Tom Ball, 1,046 ft. from E and 248 ft. from S of 71-ac. tract, A. S. Young heirs Sur. ..... Derrick.

Harry Elliott et al's No. 1 Clayton B. Brown, 732 ft. from N and 278 ft. E of NE cor., J. S. Slaughter Sur. in the George Gyer Sur. ..... Shut down 3,892 ft.

Shelby Oil Co.'s No. 1 Clayton Brown, located in Willis Coffey Sur. ..... Drlg. 2,420 ft.

NACOGDOCHES COUNTY

Benedum & Trees' No. 1 Conkwright, 150 ft. from N in center of E and W lines of A. H. Conkwright 100-ac. tract, J. A. Cherino Sur. ..... Drlg. 5,020 ft.

Bunte et al's No. 1 A. F. Boatman, 330 ft. from S and 150 ft. from W of 67-ac. tract, William A. Moore Sur. ..... Shut down 1,605 ft.

Burke et al's No. 1 F. R. Patterson, 6,515 varas from W and 315 varas from W line of Patterson 70-ac. tract, Joseph Las Santos Chay Sur. ..... Shut down 4,270 ft.

Churchill-Armstrong's No. 1 Max W. Hart, 2,640 ft. from N line and 2,640 ft. from S of N line of survey, George Pollett Sur. ..... Derrick.

Foreman and Weller's No. 1 Norris, 60 ft. NW of E line and 420 ft. S of road, in 73.5-ac. tract, Hossea Y. Barbo Sur. ..... Shut down.

Foreman et al's No. 1 Robert Mattaner, NW cor. of 520-ac. tract, J. A. Cherino grant ..... Rig up.

Harwell and Scott's No. 1 R. I. Driver, 1,500 ft. from SE cor. of P. B. Ballard 125-ac. tract, 15 miles SE of Nacogdoches in Patricia De Torres Sur. ..... Shut down 2,260 ft.

Joiner and Henson's No. 1 Andy Legg, 330 ft. from N and 330 ft. from W of tract, John Durst Sur. ..... Shut down 3,925 ft.

Morgan Oil Corp.'s No. 1 R. E. Burt, center of J. I. Reed 20-ac. tract, Jose Luy De La Bega Sur. ..... Drlg. 3,775 ft.

M. A. Vaughn's No. 1 Dixon Greer, in the M. G. Herrera Sur. ..... Derrick.

Paul Vitek et al's No. 1 Hayter estate, 1,000 ft. E of Lace Creek and 300 ft. S of Nacogdoches and Jacksonville Highway De Las Santos-Coy Sur. .... Shut down 3,000 ft.

W. W. Wheeler's No. 1 I. D. Parmley, about 155 varas N of S line and about center of E line of survey, John Kirby Sur. ..... Shut down 3,780 ft.

Sequita's No. 1 Vanover, 6,072 ft. from N and 6,636 ft. from E of Alford Oliver Sur., E. Boyd E 100-ac. tract ..... Digging pit.

Big Indian Oil Co.'s No. 1 J. N. Stewart, center of 79-ac. tract in the Jose Ignacio Ybarba Sur. ..... Location.

L. E. Trout and Dison's No. 1 E. A. Blount, 150 ft. out of NW cor. of survey and tract, E. D. Williams Sur. ..... Derrick.

RAINS COUNTY

Berry and Hale's No. 1 Ownsby, 150 ft. N and 1,100 ft. from E of most easterly SE cor. of survey, Alexander Sur. ..... Shut down 2,096 ft.

RED RIVER COUNTY

Droppleman and Bundy's No. 1 J. W. Cunningham, 250 ft. from the S and 1,066 ft. from the E lines of B. M. Ballard Sur. ..... Rig up.

J. R. Sarland's No. 1 Bryan, 1,200 ft. SW of NE cor. of Bryan 130 acres, P. Vaughn Sur. ..... Derrick up.

Harris & Joiner's No. 1 E. Howison, 225 ft. S. 185 ft. W of 79-ac. tract, William Humphreys Sur. ..... Shut down.

Pearsons et al's No. 1 J. R. Dellahunty, 500 ft. from N of Isaac Moore Sur. and 200 ft. E of E line of Robert Glass Sur. ..... Putting up new rig.

RUSK COUNTY—MISCELLANEOUS

Everett Drilling Co.'s No. 1 J. E. Ross, 100 ft. W of NE cor. of J. E. Ross 69-ac. tract, 11 miles E of Henderson in Jeremiah Leath Sur. ..... Location.

Humble Oil & Refining Co.'s No. 1-B Haywood White, 990 ft. from N and 262 ft. from W lines of 134-ac. tract in J. M. Scott Sur. ..... Location.

Devonian's No. 1 Mrs. Janie Alford, 150 ft. from N and W lines of E 40-ac. Alford tract in Henry B. Dance Sur. ..... Location.

KILGORE AREA—RUSK COUNTY

Crider and Manley's No. 1 R. A. Metley, 600 ft. from S and 1,150 ft. from W of J. T. McDaniels Sur. .... Derrick.

Doctor Thompson's No. 1, 150 ft. from N and 230 ft. from W of lease and survey, Mary Cogswell Sur. ..... Top sand 3,608 ft.; T. D. 3,625 ft.

Gulf Production Co.'s No. 1 M. R. Terrell, 330 ft. S and W of NE cor. Loc. 3 or 2,300 ft. from W and 1,550 ft. from S lines of E. G. Sevier Sur. ..... Set 10-in. csg. 131 ft.

Harry Elliott's No. 1 Carroll, 175 ft. from N and 200 ft. from E of 7-ac. tract, W. R. Cook Sur. .. .. Location.

Humble Oil & Refining Co.'s No. 1 J. R. Box, 330 ft. from S and W lines of 125-ac. tract in T. J. Martin Sur. ..... Drlg. 3,115 ft.; top Pecan Gap 2,752 ft.

Humble Oil & Refining Co.'s No. 1 R. E. Holt, 380 ft. from N and E lines of 91.4-ac. tract in the J. M. Barton Sur. ..... Derrick.

Lyle and Orr's No. 1 Powers, 2,200 ft. from N and 360 ft. from E of survey, J. Womack Sur. ..... Rig up.

Moser's No. 1 Buntyn, 554 ft. from N and 325 ft. from E of survey, the most northeasterly cor. of survey, J. C. Snow Sur. ..... Spudded; shut down.

Navarro Oil Co.'s No. 1 Hindman, 250 ft. from S and 330 ft. from W of 11-ac. lease, W. W. Simms Sur. ..... Drlg. 1,885 ft.

J. J. O'Hearn's No. 1 Mary Moore McMillan, 2,110 ft. from N and 600 ft. from W of survey, T. J. Martin Sur. ..... Drlg. 3,734 ft.; top sand 3,734 ft.

Mrs. Joyce Richardson, 150 ft. from N and 150 ft. from W of 10-ac. tract, Robert W. Smith Sur. ..... Derrick.

Shell Petroleum Corp.'s No. 1 W. F. Moore, 1,075 ft. from N and 308 ft. from E lines of H. Wiggins Sur., Abstract 875 ..... Set 10-in. csg. 105 ft.

State Production Co.'s No. 1 Gipson, 630 ft. from N and 175 ft. from E lines of tract in T. Lloyd Sur. .. Derrick.

Stephens and Turner's No. 1 Doctor Prickett, 150 ft. out of NE cor. tract in T. J. Roberts Sur. ..... Drlg. 2,935 ft.

Stanolind Oil & Gas Co.'s No. 1 Beal, 300 ft. from the S and W lines of the lease, W. P. Chisum Sur. ..... Shut down 3,495 ft.

JOINER POOL—RUSK COUNTY

T. C. Adams' No. 1 J. E. Arnold, 150 ft. from S and W lines of 26-ac. tract in M. J. Prue Sur. ..... Drlg. 1,930 ft.

Alford et al's No. 1 W. L. Thrash, 1,103 ft. from N. 420 ft. from E of SE cor., B. Smith Sur. ..... Derrick.

Armstrong and Pitt's No. 1 Cooper, 2,150 ft. from W and 166 ft. from N of survey ..... T. D. 3,520 ft.; fishing.

Armstrong's No. 1 Alford, 151 ft. from S and 1,050 ft. from W of survey, T. J. Moore Sur. ..... Derrick.

Bellinger's No. 1 F. C. Warren, 400 ft. from S of most northerly S line and 900 ft. from E of most easterly E line of survey, W. G. Tuttle Sur. ..... Drlg. 1,800 ft.

Bullock's No. 1 Alford, 1,300 ft. from S and 150 ft. from W of survey, T. J. Moore Sur. ..... Derrick.

Bridwell's No. 1 Stone, 150 ft. from N and 150 ft. from W of lease and tract, M. J. Prue Sur. ..... Top Austin chalk 3,438 ft.; T. D. 3,579 ft.

Campbell Oil Co.'s No. 1 Compton, 600 ft. from N and W line and Simon Del Rio Sur., 1½ miles NW of Minden ..... Derrick.

Cap Rock Oil Co.'s No. 1 Burton, 1,100 ft. E of W line and 520 ft. S of N line in SE cor. of 62½-ac. tract, Juan Jose Yarbo Sur. ..... Rig up.

Champline and Bass' No. 1 R. G. Mason, 3,900 ft. from E and 5,600 ft. from S of survey, J. B. De Cadena Sur. ..... Drlg. 3,580 ft.; top Pecan Gap 2,653 ft.; base 3,040 ft.

Comb's No. 1 Fox, 3,150 ft. from S and 150 ft. from E of survey, D. Carmack Sur. ..... Sand 3,715-26 ft.; run liner.

Dan Dillon et al's No. 1 W. H. Frederick (Jake), 150 ft. from E. 150 ft. from S of 50-ac. tract, Juan Ximenes Sur. ..... Derrick.

Dunnigan and Holt's No. 1 Cansler, 150 ft. N and W of SW cor. Gabe McIlroy 16.3-ac. tract in F. Cordova Sur. ..... Derrick.

Elzy and Tautesharn's No. 1 Deason, 1,300 ft. from W and 3,700 ft. from S of survey, Juan Ximenes Sur... Shut down 2,310 ft.

Elzy Drlg. Co.'s No. 1 Frederick, 150 ft. from S and 603 ft. from W of Frederick 90-ac. tract, Juan Ximenes Sur. ..... Derrick.

Empire Oil & Refining Co.'s No. 1 Leverett, 150 ft. from S and 150 ft. from W of survey, J. C. Snow Sur. ..... Running tubing; T. D. 3,700 ft.

Gulf Production Co.'s No. 1 W. L. Murphy, 150 ft. from N and W lines of 79-ac. tract in F. Cordova Sur. ..... Drlg. 2,460 ft.

Humble Oil & Refining Co.'s No. 1 Odell Blackwell, 332 ft. from N and 330 ft. from E lines of 72.5-ac. tract in the F. Cordova Sur. ..... Rig up.

TRU-LAY DOES NOT SPIN IN THE SHEAVES

Here is another *economy reason* for Tru-Lay. When you order a rotary drilling line, consider the reduced wear on your equipment . . . plus the fact that Tru-Lay Preformed Rotary Lines outlast two and sometimes three ordinary lines.

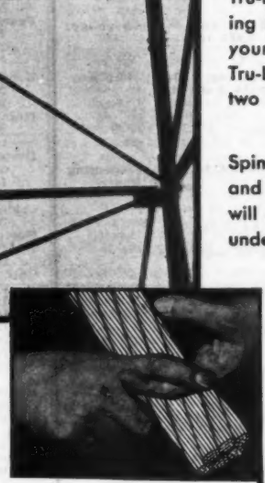
■

Spinning in the sheaves grinds the cable and sheave groove. Ordinary wire rope will also pull down in size, wearing an undersize groove on the sheave.

■

There is no spin to a Tru-Lay Preformed Rotary Line. Nor does it pull down in size. The groove it wears is the same size as the new line that is to follow.

■



RELAXED CONSTRUCTION IS THE ANSWER . . . .

The strand construction of Tru-Lay Preformed Wire Rope is clearly illustrated by folding your forefingers as illustrated at the right. Note how lightly your fingers bear against each other.

Then cross the fingers as shown here. Note the strain in the muscles of your hand. This illustrates the internal stress in ordinary wire rope, because wires and strands are held in position under strain. When you cut ordinary wire rope the strands straighten out and fly apart like a wound-up clock-spring that is suddenly released.

Relaxed construction is the reason for the remarkable service of Tru-Lay Preformed Wire Rope when used for Rotary Drilling Lines, Sucker Rod Lines, Swabbing Lines, and Tubing Lines.

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AMERICAN CABLE COMPANY
WIRE LINES
TRU-LAY *Preformed* and CRESCENT *Standard*

Humble Oil & Refining Co.'s No. 1 J. E. Glover, 380 ft. N and 330 ft. from the NW cor. of the J. R. Lindsey 45-ac. tract in the Anna Melton Sur. ..... Rig up.
Humble Oil & Refining Co.'s No. 1 W. L. Price, 1,300 ft. from N and 600 ft. from E lines of Anna Melton Sur. ..... Rig up.
Humble Oil & Refining Co.'s No. 1 J. W. Turner, 990 ft. from N and 330 ft. from W lines of 164.5-ac. tract in Anna Melton Sur. ..... Drlg. 3,344 ft.
H. L. Hunt's No. 1 A. Holt, 163 ft. from N and 237 ft. from E of A. Holt 60-ac. tract, S. P. Hollingsworth Sur. ..... Drlg. 3,002 ft.
Albert Jones' No. 1 John Minnifee, 100 ft. from S and 1,000 ft. from W of Survey on 70-ac. tract, T. J. Walling Sur. ..... Shut down 1,678 ft.
C. C. Julian's No. 1 Motley, 780 ft. from N and 1,673 ft. from W of survey, J. T. McDaniels Sur. ..... Set csg.; T. D. 191 ft.
Kimbrough et al's No. 1 Weatherby, 300 ft. from N and 300 ft. from E, Robert Martin Sur. ..... Fishing 3,650 ft.
Leonard Petroleum Co.'s No. 1 Sanger Bros., 390 ft. from N and 350 ft. from W of survey, J. P. Meredith Sur. ..... Shut down 3,510 ft.
Luling Oil & Gas Co.'s No. 1 Alford, 800 ft. from N and 4,820 ft. from E lines of the I. G. Parker Sur. ..... Building derrick.
Ray Martin et al's No. 1 Russell, 600 ft. from N and 150 ft. from E lines of lease in T. J. Martin Sur. ..... Set 10-in. csg. 118 ft.
Marr et al's No. 1 Lowns, 1,200 ft. from most westerly E line and 3,150 ft. from S line of survey, W. G. Tuttle Sur. ..... Derrick.
Mass and Tucker's No. 1 Matthews, 3,244 ft. from N, 4,356 ft. from E, Dalines Cartimas Sur. ..... Fishing 3,300 ft.
H. C. McBride's No. 1 Sue Hale, 150 ft. from S and 150 ft. from W of Sue Hale 88-ac. tract, John Darley Sur. ..... Set 12½-in. csg. 212 ft.
McMurray's No. 1 Sam Stone, 1,700 ft. from N and 6,300 ft. from W of survey ..... Drlg. 3,555 ft.
Frank Melat's No. 1 Newton Orr, 300 ft. S of N line of 202½-ac. tract, William Tippett Sur. ..... Coring 2,800 ft.
Nat Saddler's No. 1 Ed Sparks, 350 ft. from E, 150 ft. from S of survey, L. C. Riggs Sur. ..... Shut down 2,000 ft.
Pharis and Sample's No. 1 Deason, 1,558 ft. E and 155 ft. S of SE cor. of H. Brooks tract in M. J. Prue Sur. ..... Drlg. 3,650 ft.
Pitts et al's No. 1 Freeman, 1,000 ft. N of S line and 1,000 ft. E of W line of 181-ac. tract, J. Watkins Sur. ..... Rig blew down.
Priest et al's No. 1 Mayfield, 155 ft. from N and W lines of 22-ac. lease in Daniel Clark Sur. ..... Location.
Rowe et al's No. 1 Maxwell, 855 ft. from E and 237 ft. from S of B. F. Maxwell 59-ac. tract, R. H. Pinney Sur. ..... Derrick.
Stokes et al's No. 1 Mrs. M. M. Talley, 4,100 ft. from W and 1,050 ft. from N of survey ..... Moving in rig.
Shaheen and Keeler's No. 1 H. L. Griffin, 550 ft. from W and 2,000 ft. from S of survey, Juan Ximenes Sur. ..... Derrick.
Sun Oil Co.'s No. 1 O. W. Knight, 1,350 ft. from S and 250 ft. from E of survey, D. Collins Sur. ..... T. D. 3,627 ft.; making up connection.
Suttles No. 2 Holland, 156 ft. from N and 152 ft. from W of Holland 41.7-ac. tract, M. J. Prue Sur. ..... Shut down 2,300 ft.
The Texas Company's No. 1 Turner, 242 ft. from S and 242 ft. from W of survey, T. H. Smith Sur. ..... Drlg. 3,682 ft.

SMITH COUNTY

Arkansas Drilling Co.'s No. 1 Wallace, 150 ft. from N and 150 ft. from E of 200-ac. tract, W. W. Avery Sur. ..... Fishing 3,826 ft.
Bailey Gaunce et al's No. 1 S. S. Cook, 150 ft. from S and 150 ft. from W of S. S. Cook 20-ac. tract in 149-ac. tract, Juan Vargus Sur. ..... Shut down 2,560 ft.
Big Indian Oil Co.'s No. 1 Holland, 2,384 ft. from N and 1,446 ft. from E line of survey, Thomas Allen Sur. ..... Drlg. 3,770 ft.
G. B. Bunte, trustee's No. 1 A. S. Jarvis, 150 ft. from S and 150 ft. from W of 267-ac. tract, Juan Vargus Sur. ..... Rig up.
Bunte et al's No. 1 Atkinson, 1,000 ft. from S line and 1,000 ft. from N line of 330-ac. tract, Calloway Dean Sur. ..... Rig up.
Roy L. Carter's No. 1 T. O. Wright, 1,445 ft. from N and 182 ft. from E of survey, Juan Vargus Sur. .... T. D. 3,558 ft.; drlg. by tools.
Cotton Belt Oil Co.'s No. 1 C. S. Jackson, 500 ft. from N and 500 ft. from W of 39.88-ac. tract, Henry Mickleborough Sur. ..... Drlg. 2,610 ft.
Deason Oil Co.'s No. 1 T. O. Wright, 1,440 ft. from N and 250 ft. from W of T. O. Wright 86-ac. tract, Juan Vargus Sur. ..... Moving in rig.
Dumas' No. 1 Cooke, 1,558 ft. SE along center line of Highway No. 64 from point where S. S. Cooke 17.6-ac. tract W line intersects highway and 942 ft. at right angles to road, James Jordan Sur. ..... Sand 3,705-07 ft.; top Austin 3,541 ft.; base 3,762 ft.
East Texas Refining Co.'s No. 1 Colored Methodist Church, James Jordan Sur. ..... Drlg. 510 ft.
Hancock and McCarthey's No. 1 J. C. Cross, 200 ft. from E of road and 200 ft. N of S line of survey on a 13-ac. tract, Burbridge Sur. ..... Derrick.
John Hoosier et al's No. 1 W. T. Roberts et al, 300 ft. from N and 277 ft. from W lines of 13⅛ acres in Juan Vargus Sur. ..... Derrick.
H. L. Hunt's No. 1-B R. W. Fair, 250 ft. from S and E lines of 138.5-ac. tract in Juan Vargus Sur. ..... Drlg. 3,525 ft.; top Pecan Gap 2,730 ft.; base 3,085 ft.; top Austin 3,519 ft.
Imperator Oil Co.'s No. 1 I. M. Green, 140 ft. from S and 165 ft. from E line of Green 86.5-acre tract, NW of Overton and N and a little E of Big Indian No. 1 Holland ..... Shut down 1,845 ft.
Joiner et al's No. 1 W. W. Wright, 847.5 varas from E and 647 varas from S of NW Wright 225-ac. tract, Van Sickle Sur. ..... Shut down 4,210 ft.
Lawrence E. Ketch's No. 1 T. O. Wright, 700 ft. from E and 750 ft. from N of survey, Juan Vargus Sur. ..... Drlg. 1,900 ft.
Magnolia Petroleum Co.'s No. 3 J. R. Wright, 812 ft. from N and 2,050 ft. from E of survey, Juan Vargus Sur. ..... Drlg. 3,515 ft.; top Pecan Gap 2,700 ft.; base 3,025 ft.
Magnolia Petroleum Co.'s No. 4 J. R. Wright, 1,458 ft. from N and 250 ft. from E of 87.9-ac. tract or lease, Juan Vargus Sur. ..... Derrick pattern.
Magnolia Petroleum Co.'s No. 2 Loosier, 285 ft. E and 300 ft. N of NW cor. R. L. Henson 54-ac. tract in Juan Vargus Sur. ..... Coring 3,650 ft.
Magnolia Petroleum Co.'s No. 3 Loosier, 300 ft. from S and 1,000 ft. from W lines of 126.7-ac. tract in J. Vargus Sur. ..... Location.
Magnolia Petroleum Co.'s No. 4 Loosier, 175 ft. from S and E lines of 127.7-acre tract in Juan Vargus Sur. ..... Rig up.
McCarthey and Hancock's No. 1 Nellie Taylor, 250 ft. out of SW cor. of 73-ac. Taylor tract, F. M. Taylor Sur. ..... Derrick.
McMillan's No. 1 Wright, 794 ft. from N and 171 ft. from W of T. C. Wright 86-ac. tract, Juan Vargus Sur. ..... Derrick.
Morrison's No. 1 I. Roy, 330 ft. N and E from SW cor. of 87ac. tract in Henry Cools Sur. ..... Drlg. 3,400 ft.
M. M. Rowand et al's No. 1 Gibbons, 1,800 varas from W and 260 varas S of river (which is N line of survey), J. M. Garcia Sur. ..... Drlg. 3,150 ft.
Ruffin and Williams' No. 1 Hamp Florence, 700 ft. from N and 200 ft. from E of 192.5-ac. tract, Barnes Clark Sur. ..... Coring 3,965 ft.
Sinclair Oil & Gas Co.'s No. 1 Mayfield, 2,194 ft. from N and 3,625 ft. from W of 376-ac. Mayfield lease, James Jordan Sur. ..... Derrick.
Sinclair Oil & Gas Co.'s No. 2-A Jarvis, 275 ft. from E and 203 ft. from S lines of Jarvis "A" lease in Juan Vargus Sur. ..... Location.
M. T. Smith & Son's No. 1 T. O. Wright, center of 10-ac. Wiley lease in Juan Vargus Sur. ..... Location.
Sun Oil Co.'s No. 1-B Ritch, 300 ft. from N and 281 ft. from W lines of 54-ac. tract in Juan Vargus Sur. ..... Set 10-in. csg. 200 ft.
Sun Oil Co.'s No. 1 J. A. Layne, 330 ft. from N and 330 ft. from E of 103.7-ac. tract or survey, Samuel Dexter Sur. ..... Drlg. 3,011 ft.
The Texas Company's No. 3 Blackwell, 330 ft. from S and E lines of 100-ac. tract in James Jordan Sur. ..... Location.
The Texas Company's No. 1 J. W. Wilson, 300 ft. from N and 250 ft. from W lines of Wilson 125-ac. tract in David Collins Sur. ..... Location.
Mrs. S. O. Thompson's No. 1 S. S. Cooke, center of 5-ac. tract and lease in James Jordan Sur. ..... Rig up.
Vitex' No. 1 Irion, 150 ft. from S and E lines of 50-ac. tract in Mary Hughes Sur. ..... Location.

TITUS COUNTY

H. V. Cook's No. 1 M. C. Rogers, center of SW of Moore Sur. ..... Moving in rig.

UPSHUR COUNTY

Brennan and Wood's No. 1 Robertson, center of Robertson 41-ac. tract, Ira Stephenson Sur. ..... Shut down 3,661 ft.
Joe Burnham's No. 1 Lena Beck, 4,000 ft. from S and 1,200 ft. from W of survey, H. W. Augustine Sur. ... Coring 3,789 ft.
Cockrell et al's No. 1 C. A. Lee, 150 ft. from S and 150 ft. E of 26½-ac. tract, W. L. Palmer Sur ..... Derrick.
Callahan et al's No. 1 Lee R. Kay, 660 ft. from N and E lines of Charles O'Neal Sur. ..... Derrick.
Cranfill & Reynold's No. 2 A. D. Porter, 930 ft. S. and 450 ft. E of NW cor. 13⅓-ac. tract in G. W. Hooper Sur. ..... Drlg. 3,000 ft.
Taxman's No. 1 Ann Callahan, 150 ft. from E and 150 ft. from S of 38-ac. tract, E. A. J. Evans Sur. .... Top sand 3,692 ft.; tested 600 ft. oil in 5 minutes; run tubing.
Dumas et al's No. 1 A. O. Phillips, 150 ft. from N and 150 ft. from E of W 25.2-ac. of 75-ac. tract, S. Harrell Sur. ..... Skid rig.
A. H. Farver et al's No. 1 J. W. Free, 1,000 ft. N of SE cor. A. D. Porter tract and 463 ft. E at right angles, G. W. Hooper Sur. ..... Top Pecan Gap 2,442 ft.; shut down 2,800 ft.
Gillett and Tarr's No. 1 Winnie and Wofford, 150 ft. from N and 150 ft. from E lines of 80-ac. tract, John L. Lowery Sur. ..... Location.
Home Oil Co.'s No. 1 F. D. Futrell, 150 ft. out of SW cor. and 520 ft. from E and 400 ft. from S line of 7.6-ac. tract, A. Lumbrara Sur., south of Gilmer ..... T. D. 2,396 ft.
McMahon and McCullough's No. 1 E. H. Hamilton, 200 ft. from E and 150 ft. from S of 88-ac. tract, M. Chandler Sur. ..... Drlg. 1,650 ft.
McPnail and Smith's No. 1 Kay, 660 ft. from S and 660 ft. from W line of J. Elliott Sur., 1½ miles S of Big Sandy ..... Setting 6-in. csg. 3,575 ft.
G. P. Mitcham's No. 1 J. B. Bland, 165 ft. from E and 650 ft. from S of 62½-ac. tract and 15-ac. lease, G. W. Hooper Sur. ..... Derrick.
W. H. Peckham et al's No. 1 J. L. Bland, center of W half of S 30 acres of 62½-ac. tract, G. W. Hooper Sur. ..... Top Austin chalk 2,656 ft.; base 3,090 ft.; T. D. 3,664 ft.
Sorrels & Duffey's No. 1 J. W. Wooden, 200 ft. from E and 200 ft. S of survey, Isham Williams Sur. ..... Shut down 100 ft.
Sun Oil Co.'s No. 1 Vida Lee Loden, 200 ft. from N and 200 ft. from S and 150 ft. from W lines of 27.3-ac. tract in G. W. Hooper Sur. ..... Waiting on csg. 237 ft.
A. A. Trammell's No. 1 O. M. Victory, 150 ft. from E and 150 ft. from S of SW. 100 acres of survey, E. A. J. Evans Sur. ..... Top Austin chalk 3,543 ft.; T. D. 3,558 ft.
Feazel & Curtis et al's No. 1 W. M. Phillips, 300 ft. from E and 300 ft. from S of 67½-ac. tract and lease, H. Edwards Sur. ..... Sand 3,606-36 ft.; set 6⅝-in. csg. 3,606 ft.

VAN ZANDT COUNTY

Barton et al's No. 1 C. L. Hubbard, 600 ft. out of NE cor. of Hubbard 225-ac. tract, 3½ miles S of Canton, M. J. Cadena Sur. ..... Spudded and shut down.
Hart Petroleum Corp.'s No. 1 M. L. Cox, 1,785 ft. N of S line and 524 ft. E of W line of Cox 300-ac. tract in Nugent Headright Sur. ..... Shut down 1,952 ft.
H. Helms et al's No. 1 Bogue, 647 ft. W and 155 ft. S of SE cor. of J. M. Brown 70-ac. in Marshall University Sur., SE of Van ..... Shut down 3,098 ft.
Joiner et al's No. 1 J. S. Meeks, 330 ft. out of the NE cor. of the 330-ac. tract, A. Ducher Sur. ..... Fishing 2,548 ft.
Humble Oil & Refining Co.'s No. 1 L. A. Dowdle, 1,027 ft. N of S line and 150 ft. E of W line, William Daniel Sur. ..... Temp. abnd. 2,987 ft.
Kelly Oil & Gas Co.'s No. 1 Lemsford, center of Lemsford tract, John Conner Sur. ..... Shut down 2,300 ft.
Neil McMehory's No. 1 R. V. Murphy, 150 ft. from N and 150 ft. W of survey, H. Bailey Sur. ..... Shut down 2,450 ft.
W. F. Palmer et al's No. 2 W. P. Forster, 600 ft. from N and 450 ft. from E of SW cor. of Forster 151-ac. tract in the F. Montgomery Sur. ..... Shut down 3,000 ft.
W. A. Phillips et al's No. 1 Morris, 1,950 ft. S of N line and 350 ft. W of E line of center west of Norris 160-ac. tract in the C. L. Morris Headright Sur..... Waiting on drill stem.
Pure Oil Co.'s No. 2, 500 ft. N of S line and 650 ft. E of W line of lease, John Walling Sur. ..... Preparing to core 2,642 ft.
Pure Oil Co.'s No. 2 J. M. Martin, 675 ft. W of E lines and 225 ft. S of N line of lease, Mund Gross Sur. .. Location.
Pure Oil Co.'s No. 8 F. B. Smith, 469 ft. N of S line and 150 ft. W of E line of lease in John Walling Sur. ..... Location.
Pure Oil Co.'s No. 5 O. L. Swain, 200 ft. N of S and 20 ft. E of W line of lease, John Walling Sur. .... Cement setting 2,668 ft.
Van Oil Association's No. 1 Tankersley, 200 ft. from E and 1,000 ft. from S of farm, L. Landers Sur. ..... Washing to bottom at 2,530 ft.

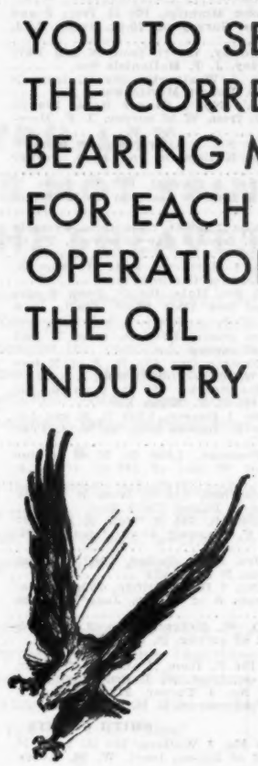
WOOD COUNTY

Loche and Clark's No. 1 A. C. Pick, 165 ft. S of NE cor. G. C. Reeves 25-ac. tract, Daniel Fuller Sur. .... Shut down 2,008 ft.
Deep Rock Oil Co.'s No. 1 Maud Smith, center of Maud Smith S 40-ac. tract, L. Johnson Sur. ..... Shut down 4,050 ft.
Main Holding Co. and Thelma Wells' No. 1 Stewart, 1,938 ft. from NE and 2,898 ft. from E line of survey, E. Rehorse Sur. ..... Shut down 500 ft.
Vitek Oil Co.'s No. 1 Rose Bogel, 250 ft. from N and 500 ft. from W of survey, Sarah English Sur. ..... Shut down 2,486 ft.
M. O. Walmer Oil Co.'s No. 1 J. A. Ivey, center of 57-ac. tract, 2 miles NE of Mineola, A. Hamilton Sur... Shut down 3,619 ft.

USE THIS CHART

IT WILL HELP YOU TO SELECT THE CORRECT BEARING METAL FOR EACH OPERATION OF THE OIL INDUSTRY

	Equipment	Bearing Metal to Use
DRILLING a. Standard or Cable Tools	Steam Engines	Eagle Dreadnaught
	Sand Reels—High Speed	Eagle Dreadnaught
	Sand Reels—Old Style	Eagle Outlasta
	Jack Posts	Eagle Outlasta
	Calf Wheels	Eagle Durable No. 4
	Bull Wheels—New Style	Eagle Outlasta
	Bull Wheels—Old Style	Eagle Durable
	Crown Blocks	Eagle Outlasta
	Electric Motors	Eagle Dreadnaught
	Countershafts	Eagle Outlasta
	Clutches	Eagle Dreadnaught
DRILLING b. Rotary Tools	Steam Engines (Single or Twins)	Eagle Dreadnaught
	Electric Motors	Eagle Dreadnaught
	Pumps Rotary	Eagle Dreadnaught
	Draw Works	Eagle Outlasta
	Rotary Rigs	Eagle Outlasta
	Crown Blocks	Eagle Outlasta
	Traveling Blocks	Eagle Outlasta
	Clutches	Eagle Dreadnaught
	Rotary Drive Shafts	Eagle Outlasta
	Gas and Oil Engines, smaller than 35 H. P.	Eagle Outlasta
PRODUCTION	Gas Engines—35 H.P. and larger	Eagle Dreadnaught
	Oil Engines	Eagle Dreadnaught
	Electric Motors	Eagle Dreadnaught
	Clutches	Eagle Dreadnaught
	Countershafts	Eagle Outlasta
	Jack Posts	Eagle Outlasta
	Crown Blocks	Eagle Outlasta
	Traveling Blocks	Eagle Outlasta
	Bull Wheels	Eagle Outlasta
	Band Wheel Powers	Eagle Durable No. 4
	Compressors	Eagle Dreadnaught
	Electrical Pumping Units	Eagle Dreadnaught
PIPE LINES	Diesel Engines	Eagle Dreadnaught
	Pumps	Eagle Dreadnaught
REFINERIES	Diesel Engines	Eagle Dreadnaught
	Pumps	Eagle Dreadnaught



The accompanying chart has been developed by our research engineers as a further service to the men responsible for the smooth running of every branch of the oil industry.

A few years ago these same engineers perfected three bearing metals designed scientifically to meet 95% of all bearing metal requirements in the industry. The steady increase in the number of users who have standardized on these three Eagle Bearing Metals—and who have taken advantage of our free bearing metal counsel—has been proof enough of the need and value of this scientific solution of an important problem.

Use this chart carefully. You will find it extremely useful and good insurance. Ask us for any further information you desire on your specific bearing metal problems.

The Eagle-Picher Lead Company, General Offices: Cincinnati.

EAGLE BEARING SERVICE

1
Eagle Dreadnaught High Speed Bearing Metal—
for extreme speed and heavy pressure conditions.

2
Eagle Outlasta General Service Bearing Metal—
for average speed and pressure conditions.

3
Eagle Durable No. 4 Bearing Metal—
for the less severe bearing requirements.

3 METALS SCIENTIFICALLY DESIGNED TO MEET 95% OF ALL BEARING METAL REQUIREMENTS

Brief Items for Petroleum Refiners

START WORK ON 10,000-BBL. LONGVIEW PLANT

The Bell Oil & Gas Co., Tulsa, last week completed arrangements for the construction of a 10,000-bbl. skimming plant near Longview in East Texas. A 24-acre site, 1½ miles south of Longview on the I.&G.N. Railroad has been acquired and construction work started this week.

The distillation equipment will consist of one 10,000-bbl. pipe still. Contract for the still, including towers, condensers and other equipment, has been let to the Southwestern Engineering Corp. of Los Angeles and Tulsa. Considerable storage and refined products will be built immediately. The Bell company officials expect to have the refinery in operation by October 15.

The company will build a 6-inch line connecting the plant to the Kilgore and Lathrop producing areas. Part of the crude oil will be furnished by the Danciger Oil & Refining Co. which is affiliated with the Bell company in the ownership of the refinery.

The Bell company has operated a refinery at Grandfield, Okla., for several years and also markets the output of other plants. Mark Finston is vice president and general manager of the company and Albert Finston, secretary and sales manager. According to officials a large part of the output of the new refinery has already been contracted to buyers. A local sales and operating department will be maintained at the refinery.

WAVERLY CO. HAS NEW BOARD OF DIRECTORS

The board of directors of the Waverly Oil Works has been reorganized with several new members. The new members are A. G. Boal, S. K. Cunningham, J. A. Griffith, S. A. Taylor and F. W. Wappat. S. M. Vockel and C. M. Barr, members of the old board, have been re-elected.

Successors to T. J. Hilliard, president and H. R. Hilliard, vice president, who recently resigned, have not been announced. The Waverly company which is one of the oldest Pennsylvania refining organizations has plants at Pittsburgh and Coraopolis, Pa.

AMTORG TRADING CORP. PLACES LARGE ORDER

Russian refining facilities are rapidly being improved and expanded as indicated the past week when the Amtorg Trading Corp. representing the Russian government placed a contract for five high vacuum distilling units with a combined capacity of 30,000 bbls. daily. These units will be used to process reduced crudes.

The contract was placed with the Alco Products, Inc., a division of the American Locomotive Co. The fabrication will be done at the Dunkirk, N. Y., plant of the latter company and deliveries will start this fall.

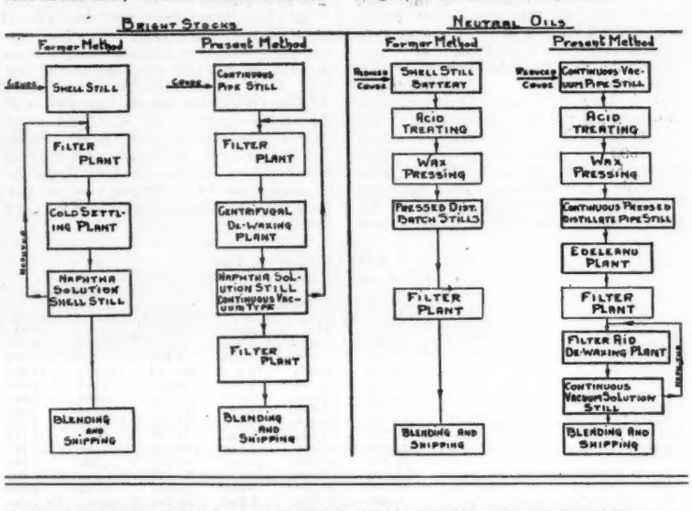
COMPLETE FRENCH REFINERY

The Campagnie des Prodcuits Chimiques et Raffineries de Berre has completed a refinery at Berre, near Marseilles in France. It is expected that the plant will be the first of the new French plants to start operating. The operating company is controlled by St. Gobian, a holding company which through affiliated interests expects to develop production in Colombia. The plant has a capacity of approximately 8,000 bbls. daily but under the present French import law will only be allowed to operate 50 per cent capacity.

TIDE WATER SPENDS $2,000,000 IMPROVING REFINERY AT BAYONNE

NEW YORK, July 3.—Substantial improvements in refining technique, with a resulting improvement in quality of products, has been achieved by Tide Water oil Co., eastern unit of Tide Water Associated Oil Co., through the completion of a modernization program, involving the expenditure of $2,000,000 at its Bayonne plant. Among the important changes at the Bayonne refinery are included a new vacuum pipe still, the largest in the world of its type, which replaced the reduced crude shell still battery for the manufacture of neutral oils; new refrigerating plant and reducing pipe still; equipment for the application of the Edeleanu process for the manufacture of lub oils; vacuum filter-aid dewaxing plant, described as an entirely new departure in refinery technique, and developed by Tide Water technicians and new twin unit continuous solution vacuum steam still built to replace the old type shell still installation. Old style batch type stills have been replaced by a modern high speed pipe still and fractionating tower for the manufacture of cylinder stock. Other improvements include a new centrifugal dewaxing plant using Sharples supercentrifuges; new and modern equipment in the grease plant; and improved processes for the manufacture of gasoline and kerosene.

The accompanying chart which appeared in "Tide Water World" illustrates the changes made in the manufacture of bright stocks and neutral oils.



GOVERNMENT SURVEY SHOWS RAPID GAIN IN CRACKING FACILITIES

By G. R. Hopkins
United States Bureau of Mines

According to reports as of January 1, 1931, the total daily charging capacity of the cracking plants, both completed and under construction, in the United States amounted to 1,950,781 bbls., an increase over the previous year of 14 per cent. The total daily capacity of the operating plants amounted to 1,594,990 bbls., or 82 per cent of the grand total, the capacity of the inoperative plants was 244,661 bbls., ro 12 per cent of the total, while the capacity of the plants under construction amounted to 111,130 bbls., or 6 per cent. In comparison with a year ago, these data indicate a decline in the total capacity of the plants being built but show material increases in the capacity of both the other two classes. The increase in total inoperative capacity and the decline in construction in 1930 undoubtedly resulted from unsatisfactory economic conditions.

The total number of cracking units completed or under construction on January 1, 1931, totaled 1,868 as compared with 2,002 the previous year and with a high of 2,559 on June 1, 1926. During the period between June 1, 1926, and January 1, 1931, the total charging capacity of the cracking plants has more than doubled, but the number of units has shown a material decline. This condition has been brought about largely through the dismantling of many Burton stills of small capacity and through the tendency to increase the size of the new units. The largest unit that can be identified in this survey has a daily charging capacity of 10,000 bbls., but undoubtedly there are some that would exceed this in size.

Texas Leads

Texas, with a total of 575,300 bbls., ranked far ahead of the other states in charging capacity, and was followed in order by California, Indiana, Oklahoma, and Pennsylvania. Indiana, with only five refineries, ranked third in cracking capacity, which illustrates the importance of the Chicago district as a gasoline producing center. Not all of the states showed a gain in capacity during the year; in fact, four of them, namely Illinois, Louisiana, New York, and Oklahoma, reported a decline.

The production of gasoline by means of the cracking process has shown a steady increase since such statistics were first compiled (1925). In 1930 the production by this method amounted to 164,243,000 bbls., an increase over 1929 of 20,516,000 bbls., or 14 per cent. As the increase in total motor production in 1930 was only 0.5 per cent, the relative proportion of cracked gasoline rose from 33 per cent in 1929 to 37.7 per cent in 1930. In December, 1930, the ratio of cracked gasoline to the total reached 41.1 per cent, the first month that it had exceeded 40 per cent.

The Texas district led in the produc-

(Continued on Page 117)

J. D. WRATHER BUILDING REFINERY AT KILGORE

J. D. Wrather and associates have started construction of a 1,000-bbl. skimming plant at Kilgore in East Texas. The plant will later be enlarged to 3,500 bbls. daily, according to Mr. Wrather.

Mr. Wrather, who has built a large number of skimming plants in the Mid-Continent Field and the Middle West, recently completed a 3,000-bbl. plant at Overton, Tex., which is operated under the name of the Overton Refining Co., Inc. He also is president of the Amarillo Producers & Refiners Corp. and the Roosevelt Oil Co. of Mount Pleasant, Mich.

COMPLETING NEW REFINERY

LOS ANGELES, Calif., July 6.—The Terra Bella Refining Co. is making preparations to complete its new refinery at Terra Bella, Calif., following a delay of several weeks. Present plans call for completion within the next 60 days. This plant will operate on oil produced in the Terra Bella district located near Porterville in Tulare County. Operations of this plant will be limited to the production of lub oil for the present. Terra Bella crude is quite rich in lub stock but does not contain any of the lighter fractions.

SINCLAIR AT GLADEWATER

The Sinclair Refining Co. is assembling equipment near Gladewater in the East Texas Field to build a 2,000-bbl. refinery. Crude will be run from the company's wells in the local area and the manufactured products will be distributed locally. Any excess fuel production will be pumped to the Houston refinery through the company's crude line. The fuel will be mixed with the crude because of the small volume. Much of the equipment has been reclaimed from other Sinclair plants. One still and auxiliary equipment will be erected and the plant will not include cracking facilities.

ASSOCIATED BUYS SUNSET

Control of the Sunset Pacific Oil Co., Los Angeles has been purchased by the Associated Oil Co. of San Francisco. The Sunset company was an outgrowth of the defunct Julian Petroleum Corp., the latter company being reorganized under the new name. Properties of the Sunset include production, refining and marketing. The company has a number of bulk and service stations in the Los Angeles territory.

The Sunset refineries have been shut down for some time. The Associated company purchased $7,683,000 of first mortgage bonds and $1,480,000 in three-year notes of the Sunset company. It already had $2,000,000 in bonds of the company.

KENDALL ENLARGES CRACKING

The Kendall Refining Co. will increase the cracking capacity of its Bradford, Pa., refinery with the installation of a 1,250-bbl. unit of the Dubbs type. Contract for the installation of the unit which will cost approximately $350,000 has been let to the Arthur G. McKee Co. of Cleveland, Ohio. The Kendall refinery has had a unit of the Dubbs process in operation at its refinery for several years.

INSTALLING STABILIZER

The Producers & Refiners Corp. is installing a pressure distillate stabilizer and vapor recovery plant at its West Tulsa, Okla., refinery. The unit is being installed by the Burrell-Mase Engineering Co., of Pittsburgh, Pa.

Manufacture of Natural Gasoline

Factors Which Enter Into the Design of A Modern Absorber

By R. A. Boyd
Columbian Gasoline Corp.*

The design of absorbers have a few major outstanding principles. Among these are diameter of absorber, arrangement of caps, distribution and flow of liquids, arrangement of plates with respect to adjacent plates, type of bubble caps, number of caps required, the overflows and carry over or velocities at which an oil will carry out of the absorber, the diameter of the absorber which of course defines the diameter of the plate is a function of the amount of gas to be put up through the absorber, and the maximum amount of oil to strip the gas passing up through the absorber.

The minimum diameter may be determined on the basis of the velocity of the gas rising through the free space between the plates. This is largely a matter of what is considered good practice.

The velocity must be kept at a point below that at which serious entrainment occurs, that is the carrying of liquids mechanically from one plate to that above and finally out at the gas outlet, as this detracts from the efficiency of the absorber.

The general opinion in the industry seems to range from 1 to 2 feet per second as constituting good practice.

However, the tendency of a moving vapor to entrain particles of liquid is largely a function of its density.

If we assume all particles to be of the same size in general, it might be said that the tendency to entrain varies approximately as the square root of the vapor density, assuming that the liquid particles are of the same diameter and specific gravity and that the density of the vapor is small with respect to that of the liquid. From the above we might set up the rule that:

$$v = \frac{K}{\sqrt{S}}$$

Where v is velocity of gas,

S is density of gas under operating conditions,

And K is a constant.

Assuming that 1.5 feet per second is good average practice and 0.2 pound per cubic foot as the specific weight of gasoline vapor, we find K to be 0.67. Using this value of K for very light vapors such as steam or highly evacuated vapors with a specific weight of .02, we find a permissible velocity of 4.7 feet per second, while for heavier vapors with a weight as high as 1.0 pound per cubic foot the velocity indicated would be only 0.67 foot per second.

The absorbers are the main controlling factor in the efficiency of a gasoline plant, for if the absorbers do not extract the gasoline from the gas, a plant cannot operate efficiently regardless of the efficiency of the other equipment.

An ideal absorber would have an unlimited number of plates, but as this is impractical the absorber must be designed with a certain definite number of plates, with this point in view to have the absorber outlet oil as nearly in equilibrium with the wet inlet gas as possible.

There has been quite some argument as to whether or not an absorber efficiency of over 100 per cent is possible, or in other words, whether or not the oil can leave the absorber supercharged with any one component.

The following argument has been offered in defense of more than 100 per cent efficiency. In the upper trays the oil is saturated with the lighter fractions until its vapor pressure is equal to the working pressure. As it travels down through the absorber these must be driven off and replaced by heavier fractions. If the trays were 100 per cent efficient as fractionators this replacement would be complete and the oil would leave the absorber in exact equilibrium with the entering gas. Since, however, the absorber is not efficient as a fractionator, the excess propane is not driven off but leaves the absorber in the fat oil. It is quite possible that much of the light fractions are driven out of solution, but are entrained in the form of very fine bubbles which do not have time to separate out of the oil.

Tests have been made on absorbers taking oil from the different trays. These tests show a very rapid absorption in the top and bottom trays for all fractions, the light fractions remaining nearly constant in the intermediate trays, and only the heavier fractions showing gradual absorption throughout.

We might say, however, that the extraction of butane is the most important function of an absorber. We do not want the lighter fractions and we look upon the absorption of these as a necessary

(Continued on Page 117)

*Delivered at plant foremen's meeting.

ONE MILLION GALLON DAILY DECLINE IN MAY PRODUCTION

Natural gasoline production in United States in May was almost 1,000,000 gallons less than in May of last year, according to the latest report of the Bureau of Mines which covers May operations. The May production was the lowest daily average since 1928. The production has been declining steadily for over a year, the May daily average being 3.4 per cent less than in April.

The Appalachian area which produced 6,700,000 gallons in May of last year has dropped to 5,900,000 gallons in May this year. In Illinois, Kentucky and states adjoining the production dropped from 1,000,000 gallons in May, 1930, to 700,000 gallons in May of this year.

Somewhat similar conditions account for the decline in many of the older fields west of the Mississippi River, where over 85 per cent of the production originates. In Oklahoma, the state production has dropped from 54,000,000 gallons in May, 1930, to 42,600,000 gallons in May this year. Comparing the two months, the May production in the Oklahoma City Field jumped from 3,600,000 to 5,100,000 gallons. Other fields, however, declined. The Greater Seminole area, which a year ago was furnishing almost 45 per cent of the State's production, has declined 50 per cent in output during the past year. The May production totaled 16,100,000 gallons, which compares with 24,900,000 gallons a year ago.

In Texas the Panhandle area, from which 50 per cent of the State's natural gasoline production comes, declined from 21,900,000 gallons in May, 1930, to 17,200,000 gallons in May this year. The drop in West Central Texas was from 12,600,000 gallons in May, 1930, to 10,700,000 gallons in May, 1931.

In contrast to the other states, the Rocky Mountain production jumped from 4,600,000 gallons in May, 1930, to 6,100,000 gallons. The production in the Salt Creek area is said to have increased and the output of some of the smaller pools has also gained.

As has been the case for several months, Kettleman Hills is the only major producing area in California to show a gain in natural gasoline production. The May production this year totaled 15,400,000 gallons, which compares with 14,600,000 gallons in May last year. Huntington Beach, Long Beach, Santa Fe Springs and Ventura avenue, all of the Southern California area, have decreased from 10 to 40 per cent in natural gasoline production during the past year.

NATURAL GASOLINE, MAY, 1931
(Thousands of gallons.)

	Production				Stocks end of month	
	May, 1931	April, 1931	May, 1930	Jan.-May, 1931	May, 1931	April, 1931
Appalachian	5,900	6,800	6,700	37,600	5,601	5,574
Illinois, Kentucky, etc.	700	800	1,000	4,600	497	542
Oklahoma	42,600	41,600	54,000	209,900	15,867	15,505
Oklahoma City	5,100	4,600	3,600	20,900	4,147	3,607
Osage County	5,400	5,600	6,100	29,700	3,560	3,524
Seminole, etc.	16,100	16,600	24,900	81,700	3,230	3,899
Rest of State	16,000	14,800	19,400	77,600	4,830	4,475
Kansas	2,500	2,800	3,000	13,500	2,142	2,477
Texas	35,700	37,200	43,100	189,800	9,995	11,473
Panhandle	17,200	17,500	21,900	90,300	4,785	5,781
North Texas	3,000	3,400	3,800	17,400	1,015	1,402
West Central	10,700	11,100	12,600	55,800	3,153	3,290
Rest of State	4,800	5,200	3,800	26,300	1,042	1,000
Louisiana	4,100	4,700	6,000	23,200	805	1,169
Arkansas	2,500	2,500	2,800	13,600	222	254
Rocky Mountain	6,100	5,500	4,600	27,400	1,118	1,016
California	60,100	55,700	69,700	298,800	5,590	4,253
Huntington Beach	1,900	1,900	2,700	9,500	.....	.....
Kettleman Hills	15,400	14,800	14,600	72,900	.....	.....
Long Beach	11,700	11,300	14,400	62,900	.....	.....
Santa Fe Springs	11,200	10,800	17,200	55,200	.....	.....
Ventura Avenue	4,800	4,800	4,900	23,900	.....	.....
Rest of State	15,100	14,600	15,900	74,200	.....	.....
Total	160,200	160,600	189,900	817,200	41,837	42,254
Daily average	5,170	5,350	6,130	5,450	.....	.....
Total (thous. of barrels.)	3,814	3,824	4,521	19,457	996	1,006
Daily average	123	127	146	130	.....	.....

PRODUCTION AND DISTRIBUTION OF NATURAL GASOLINE
(Thousands of barrels of 42 U. S. gallons.)

	May, 1931		April, 1931		Jan.-May, 1931	
	Total	Daily av.	Total	Daily av.	Total	Daily av.
Production	3,814	123	3,824	127	19,457	129
Decrease in all stocks	....	...	....	...	.....	...
Total	3,814	123	3,824	127	19,457	129
Blended at refineries	3,111	100	2,789	93	15,095	100
Run through pipe lines in California	85	3	88	3	389	3
Blended at plants east of California	14	1	13	1	67	1
Jobbers, exports, etc.	306	10	250	8	1,575	10
Increase in all stocks	236	7	189	6	1,090	7
Balance	67	2	495	16	1,241	8
Total	3,814	123	3,824	127	19,457	129

SLIGHT DECREASE IN CALIFORNIA'S OUTPUT

One hundred twenty-six natural gasoline plants in California with a daily indicated capacity of 2,541,049,000 feet, report a recovery of 60,116,884 gallons of natural gasoline from 41,666,462,000 feet of gas treated in May. This is a decrease of 428 bbls. in daily average production.

Utilization of natural gasoline, including shipments, amounted to 1,395,820 bbls., an increase over April of 149,819 bbls. Daily average utilization of 45,026 bbls. was 1,147 bbls. less than daily average production of 46,173 bbls.

Stocks of natural gasoline at the end of May amounted to 1,731,365 bbls., of which 133,084 bbls. were reported by natural gasoline plant operators and 1,598,281 bbls. by refinery operators. This is an increase of 35,534 bbls. over April stocks. This stock figure of 1,731,365 bbls. is approximately 38½ days' supply at the current rate of consumption.

The following table summarizes the California report for May:

CALIFORNIA NATURAL GASOLINE PRODUCTION, DISTRIBUTION AND STOCKS MAY, 1931

Production by Fields

	Gas treated (M.C.F.)	Natural gasoline produced (gals.)
Fullerton-Whittier	735,820	1,745,142
Midway	1,894,807	3,467,456
Huntington Beach	615,573	1,864,547
Kettleman Hills	12,903,869	15,442,524
Long Beach	6,133,739	11,742,607
Richfield	482,330	618,112
Santa Fe Springs	7,506,479	11,142,816
Seal Beach	645,195	1,196,680
Ventura Avenue	5,090,738	4,788,284
All other fields	5,606,923	8,116,685
Total	41,666,462	60,116,884

Production by Methods

Type of plant—	Gas treated (M.C.F.)	Natural gasoline produced (gals.)
Oil absorption	41,491,590	59,903,879
Compressor	174,872	213,005
Total	41,666,462	60,116,884

Finished gasoline produced at plants, 123 bbls.

Distribution

	(Bbls.)	(Bbls.)
Stocks first of month	.....	1,595,831
Produced during month	.....	1,431,354
Quantity mixed with crude or unfinished oils	86,061	.....
Used in blending at refineries	971,923	.....
Shipments	336,226	.....
Stocks end of month	1,731,365	.....
Balance*	1,610	.....
Total	3,127,185	3,127,185

Stocks

	(Gals.)	(Bbls.)
Natural gasoline held by natural gasoline plant operators	5,589,536	133,084
Natural gasoline held by refineries	67,127,802	1,598,281
Total	72,717,338	1,731,365

*Includes evaporation losses, purchase by jobbers for blending, etc.

TO START EXPERIMENTAL PLANT AT CALGARY SOON

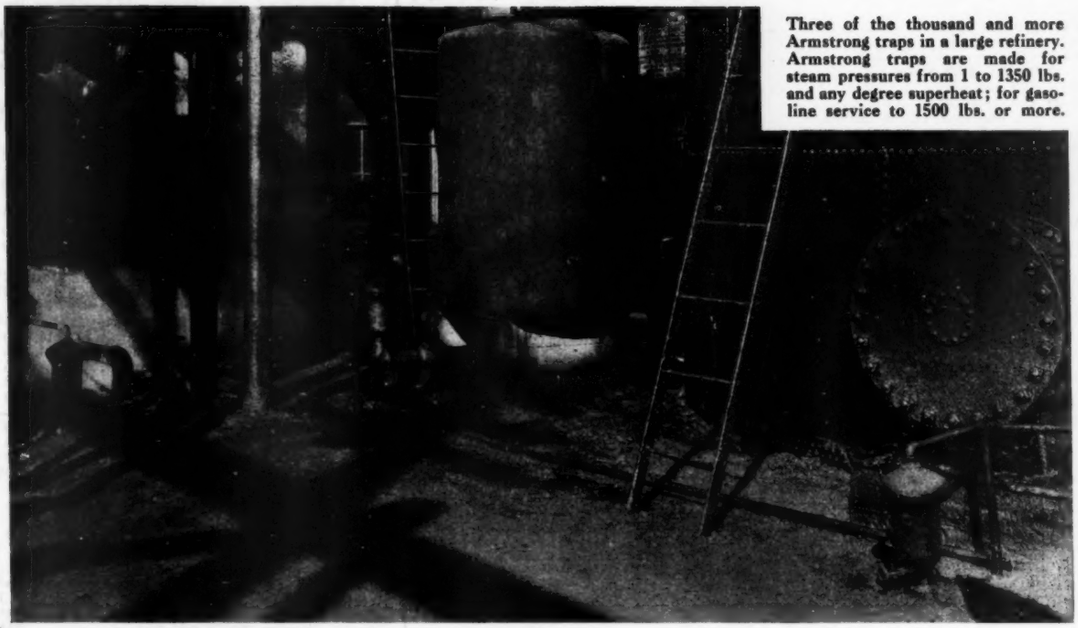
CHATHAM, Ontario, July 6.—Addressing the Calgary Chemical Club recently, Dr. E. H. Boomer of the University of Alberta announced that in August experimental production of benzine from Turner Valley gas would be commenced on a small scale in a plant now being erected at the Calgary Institute of Technology.

The experiments, in charge of Doctor Boomer, will be carried on for possibly a year by which time the various cost phases of the process should be definitely known. If the experiments are satisfactory, the next step will be the erection of a large commercial plant.

Doctor Boomer stated that 1¼ gallons of benzine could be produced from each 1,000 feet of gas. This is considerably better than the average naphtha-gas ra-

(Continued on Page 115)

If you bought traps by the pound or bushel



Three of the thousand and more Armstrong traps in a large refinery. Armstrong traps are made for steam pressures from 1 to 1350 lbs. and any degree superheat; for gasoline service to 1500 lbs. or more.

—the Armstrong Inverted Bucket Trap might not rate so high although its small size and light weight would still make it a favorite. The most important things about a trap, however—which determine whether it costs you money or saves it for you—cannot be measured in pounds or pieces. These things are *design* and *service.*

Armstrong design—the pioneer inverted bucket—assures you practically foolproof performance. There can be no air-binding . . . the upward flow of condensate keeps scum and sediment from clogging the trap . . . heat-treated chrome steel valves give efficient service long after other types are scored by wire-drawing . . . the traps are small and compact enough to be supported by connecting pipes . . . they have greater capacity than most traps of much larger size.

Of additional value to the purchaser is the unequalled Armstrong background. This trap is made and guaranteed by a company that has specialized on traps alone for over twenty years, and which maintains a nation-wide service organization. Armstrong performance has been proved so many times, under so many varying conditions, that we are glad to send anyone as many traps as desired for 90 days' free trial. While Armstrongs are not bought by the pound or bushel, they *are* bought by the dozen, by the hundred, and even by the thousand! More Armstrongs are in use than any other mechanically operated trap.

Armstrong Machine Works

868 Maple Street - Three Rivers, Michigan

Stocks in all principal cities

REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

GASOLINE AND NAPHTHA

	July 7		June 30		June 23	
OKLAHOMA (Group 3)—						
50-52 450 endpoint	.02½	.02⅝	.02⅜	.02½	.02¼	.02⅜
56-58 450 endpoint	.02⅜	.02½	.02¼	.02½	.02	.02¼
58-60 437 endpoint (U. S. Motor)	.02⅜	.03	.02⅜	.02⅝	.02¼	.02⅝
60-62 437 endpoint	.02⅜	.03	.02⅜	.02⅝	.02¼	.02⅜
60-62 400 endpoint	.02⅞	.03⅛	.02⅝	.02⅞	.02⅝	.02¾
64-66 375 endpoint	.03	.03⅛	.03	.03⅛	.02⅝	.03
68-70 360 endpoint	.03⅛	.03¼	.03⅛	.03¼	.02⅞	.03⅛
64-66 437 endpoint (blend)	.02¼	.02½	.02¼	.02½	.02	.02¼
NORTH TEXAS—						
50-52 450 endpoint	.02⅜	.02½	.02¼	.02½	.02¼	.02½
58-60 450 endpoint	.02⅝	.02⅞	.02⅛	.02¼	.02	.02⅛
58-60 437 endpoint (U. S. Motor)	.02½	.02⅝	.02¼	.02½	.02⅛	.02½
60-62 400 endpoint	.02⅝	.02¾	.02½	.02¾	.02¼	.02¾
64-66 390 endpoint	.02¾	.03	.02⅝	.03	.02½	.03
64-66 375 endpoint	.03	.03⅛	.02⅞	.03⅛	.02⅝	.03⅛
68-70 360 endpoint	.03⅛	.03⅜	.03	.03⅛	.02⅞	.03⅛
64-66 437 endpoint (blend)	.02¼	.02½	.02¼	.02½	.02	.02½
***NORTH LOUISIANA—**						
58-60 437 endpoint (U. S. Motor)	.02¾	.03	.02¾	.03	.02⅝	.02¾
***ARKANSAS—**						
58-60 437 endpoint (U. S. Motor)	.02¾	.03	.02¾		.02⅝	.02¾
PENNSYLVANIA—						
52-54 Naphtha	.04½		.04½		.04½	
54-56 Naphtha	.04⅝		.04⅝		.04½	.04¾
58-60 Gasoline	.04⅝		.04⅝		.04½	.04¾
60 Gasoline	.04½		.04½		.04¾	.05
62 Gasoline	.05	.05¼	.05	.05¼	.05	.05¼
64 Gasoline	.05½		.05½		.05½	
68-70 350 endpoint gasoline	.05¼	.05½	.05¼	.05½	.05½	
CALIFORNIA—						
†54-58 437 endpoint (U. S. Motor) domestic	.04½	.06¼	.05	.06½	.04½	.06
†58-60 400 endpoint domestic gasoline	.04¼	.06	.04½	.06¼	.04	.06½
CHICAGO DISTRICT (Based on Group 3)—						
50-52 450 endpoint (Naphtha)	.02¼	.02½	.02¼	.02½	.02¼	.02½
58-60 437 endpoint (U. S. Motor)	.02½	.02⅞	.02¼	.02½	.02¼	.02½
60-62 400 endpoint	.02⅝	.03	.02½	.02⅞	.02½	.02¾
64-66 375 endpoint	.03⅛	.03¼	.02¾	.03	.02¾	.03
64-66 437 endpoint (blend)	.02½	.02¼	.02⅛	.02¼	.02⅛	.02¼
68-70 360 endpoint	.03¼	.03½	.03	.03¼	.03	.03¼
GULF COAST (Export)—						
58-60 U. S. Motor	.03½		.03½		.03½	
60-62 400 endpoint	.03⅝		.03⅝		.03⅝	
61-63 390 endpoint	.03¾		.03¾		.03¾	
64-66 375 endpoint	.03¾		.03¾		.03¾	

*Louisiana, Arkansas, Mississippi and East Texas delivery. †For local consumption.

NATURAL GASOLINE

	July 7		June 30		June 23	
OKLAHOMA (Group 3)—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.02		.01⅞	.02	.01⅞	.02
Grade AA, 80-87.9, 375 e.p., rec. 90%	.01⅜		.01⅝		.01⅝	
Grade B, 76-83.9, 375 e.p., rec. 85%	.01⅝		.01½		.01½	
Grade BB, 84-92, 375 e.p., rec. 85%	.01½	.01⅝	.01½		.01½	
Grade C, 80-92, 375 e.p., rec. 78%	.01½	.01⅝	.01½		.01½	
NORTH TEXAS—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.01⅜	.02	.01⅜	.02	.01⅜	.02
Grade AA, 80-87.9, 375 e.p., rec. 90%	.01⅝		.01⅝	.01½	.01½	.01⅝
Grade B, 76-83.9, 375 e.p., rec. 85%	.01½		.01½		.01½	
Grade BB, 84-92, 375 e.p., rec. 85%	.01⅝	.01½	.01⅝	.01½	.01⅝	.01½
Grade C, 80-92, 375 e.p., rec. 78%	.01⅝		.01⅝		.01⅝	
NORTH LOUISIANA—						
Grade AA, 80-87, 375 e.p., rec. 90%	.01⅜		.01⅝		.01⅝	
Grade BB, 84-92, 375 e.p., rec. 85%	.01⅝		.01½		.01½	
Grade C, 80-92, 375 e.p., rec. 78%	.01⅝		.01½		.01½	
CALIFORNIA—						
75-78 375-390 endpoint	.03¼	.04¼	.03¼	.04¼	.03	.04
CHICAGO DISTRICT (Based on Group 3)—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.02		.01⅞	.02	.01⅞	.02
Grade AA, 80-87.9, 375 e.p., rec. 90%	.01⅜		.01⅝		.01⅝	
Grade BB, 84-92, 375 e.p., rec. 85%	.01⅝		.01½		.01½	

BURNING OIL

	July 7		June 30		June 23	
OKLAHOMA (Group 3)—						
41-43 water white kerosene	.01⅞	.02	.01⅞	.02	.02	.02¼
42-44 water white kerosene	.02	.02¼	.02	.02¼	.02¼	.02½
NORTH TEXAS—						
41-43 water white kerosene	.01⅜	.02	.01⅜	.02	.02	.02¼
40-41 water white kerosene	.01⅝		.01⅝		.02	
***NORTH LOUISIANA—**						
41-43 water white kerosene	.02½		.02½		.02⅝	
***ARKANSAS—**						
41-43 water white kerosene	.02½		.02½		.02½	.02⅝
PENNSYLVANIA—						
43 Kerosene prime white	.03⅝		.03⅝		.03¾	
45 Kerosene water white	.03⅝	.03¾	.03⅝	.03¾	.03⅝	.04
46 Kerosene water white	.03⅞	.04⅛	.03⅞	.04⅛	.03⅞	.04¼
CALIFORNIA—						
38-40 water white Kero. (high burning test)	.04	.05½	.04	.05½	.04	.05½
CHICAGO DISTRICT (Based on Group 3)—						
41-43 water white kerosene	.02	.02½	.02	.02½	.02	.02½
42-44 water white kerosene	.02½	.02¼	.02½	.02¼	.02½	.02¼
GULF COAST (Export)—						
41-43 prime white	.03½		.03½		.03½	
44 prime white	.03½	.03¾	.03½	.03¾	.03½	.03¾

*Louisiana, Arkansas, Mississippi and East Texas delivery.

FUEL OIL

	July 7		June 30		June 23	
OKLAHOMA (Group 3)—						
Below 18 gravity Fuel Oil, per bbl.	.25	.30	.25	.30	.25	.30
18-22 Fuel Oil, per bbl.	.27½	.35	.27½	.35	.27½	.35
20-22 Fuel Oil, per bbl.	.30	.35	.30	.35	.30	.35
22-26 Fuel Oil, per bbl.	.30	.35	.35	.40	.35	.40
24-26 Fuel Oil, per bbl.	.35	.40	.40	.45	.40	.45
26-30 Fuel Oil, per bbl.	.40	.45	.45	.50	.45	.50
28-30 Fuel Oil, per bbl.	.40	.45	.45	.50	.50	.55
32-36 Gas Oil (industrial)	.00¾	.01	.00¾	.01	.00¾	.01
32-36 Gas Oil (straw color, high cold test)	.00¾	.01	.00¾	.01	.00¾	.01
32-36 Gas Oil (straw color, low cold test)	.01⅛	.01¼	.01¼	.01½	.01¼	.01½
36-38 Distillate	.01¼	.01⅜	.01¼	.01⅜	.01¼	.01⅜
38-40 Straw Distillate	.01¼	.01¾	.01⅝	.01¾	.01⅝	.01¾

Note—Fuel oils over 40 cold test generally 5 to 10 cents per barrel less.

NORTH TEXAS—						
Below 20 gravity Fuel Oil, per bbl.	.20	.25	.20	.25	.20	.25
24-26 Fuel Oil, per bbl.	.25	.35	.25	.35	.25	.35
32-36 Gas Oil (industrial)	.00¾	.01	.00¾	.01	.00¾	.01
38-40 Straw Distillate	.01¼	.01½	.01¼	.01½	.01¼	.01½
***NORTH LOUISIANA—**						
18-20 Fuel Oil, per bbl.	.50	.60	.50	.60	.50	.60
30-32 Gas Oil (low cold test)	.01¾	.02	.01¾	.02	.01¾	.02
***ARKANSAS—**						
33-36 Distillate	.02¼	.02½	.02¼	.02½	.02¼	.02½
30-32 Gas Oil	.01¾	.02	.01¾	.02	.01¾	.02
16-22 Refinery Fuel Oil, per bbl.	.50	.55	.50	.55	.50	.55
GULF COAST (South Texas)—						
Gas Oil	.02½	.02¾	.02½	.02¾	.02½	.02¾
Bunker C Fuel (cargo lots), per bbl.	.60		.60		.60	
Bunker C Fuel (small lots)	.70		.70		.70	
PENNSYLVANIA—						
30-34 Fuel Oil	.02½		.02½		.02½	
36-40 Fuel Oil	.02½		.02½		.02½	
CALIFORNIA—						
42-45 480 endpoint engine distillate	.04½	.06	.04½	.06	.04½	.06
15-19 Fuel Oil, Bunker (at tidewater), bbl.	.60	.80	.60	.80	.55	.80
15-19 Fuel Oil (cargo lots, at tidewater), bbl.	.55	.75	.55	.75	.55	.75
†15-19 Fuel Oil, f.o.b. tank cars	.35	.75	.35	.75	.30	.75
27 plus Diesel, per bbl.	.70	.95	.70	.95	.70	.95
30-34 Gas Oil	.70	.95	.70	.95	.70	.95
CHICAGO DISTRICT (Based on Group 3)—						
18-22 Fuel Oil, per bbl.	.20	.25	.20	.25	.22½	.27½
22-26 Fuel Oil, per bbl.	.25	.30	.25	.30	.27½	.32½
28-30 Fuel Oil, per bbl. (zero)	.42½	.47½	.42½	.47½	.47½	.52½
32-36 Gas Oil (industrial)	.00¾	.01	.00¾	.01	.00¾	.01
32-36 Gas Oil (zero)	.01	.01½	.01	.01½	.01⅛	.01⅜
38-40 Straw Distillate	.01	.01¼	.01	.01¼	.01⅛	.01⅝

*Louisiana, Arkansas, Mississippi and East Texas delivery. †Lowest priced fuel oil has high sulphur content.

LUBRICATING OIL AND WAX

	July 7		June 30		June 23	
OKLAHOMA (Group 3)—						
100 vis., 2 color, 20-25 cold test	.04½	.04¾	.04½	.04¾	.04½	.04¾
100 vis., 3 color, 20-25 cold test	.04¼	.04½	.04¼	.04½	.04¼	.04½
150 vis., 3 color, 20-25 cold test	.06¾	.07¼	.06¾	.07¼	.06¾	.07¼
150 vis., 4 color, 20-25 cold test	.06	.06½	.06	.06½	.06	.06½
180 vis., 3 color, 23-28 cold test	.07¾	.08¼	.07¾	.08¼	.07¾	.08¼
180 vis., 4 color, 23-28 cold test	.07½	.08¼	.07½	.08¼	.07½	.08¼
180 vis., 5 color, 23-28 cold test	.07¼	.07½	.07¼	.07½	.07¼	.07½
200 vis., 3 color, 23-28 cold test	.08½	.09	.08½	.09	.08½	.09
200 vis., 4 color, 23-28 cold test	.08½	.09¼	.08½	.09¼	.08½	.09¼
200 vis., 5 color, 23-28 cold test	.08	.08½	.08	.08½	.08	.08½
240 vis., 3 color, 25-30 cold test	.10¾	.11¼	.10¾	.11¼	.10¾	.11¼
240 vis., 4 color, 25-30 cold test	.10	.10½	.10	.10½	.10	.10½
240 vis., 5 color, 25-30 cold test	.09½	.10	.09½	.10	.09½	.10
280 vis., 3 color, 25-30 cold test	.12¼	.12¾	.12¼	.12¾	.12¼	.12¾
280 vis., 4 color, 25-30 cold test	.11¼	.11¾	.11¼	.11¾	.11¼	.11¾
280 vis., 5 color, 25-30 cold test	.10¾	.11½	.10¾	.11½	.10¾	.11½
Cylinder Stocks:						
600, steam refined, light green	.04	.05½	.04	.05½	.04	.05½
600, steam refined, dark green	.02½	.03	.02½	.03	.02½	.03
190-200 vis., D color, Bright Stocks	.17		.17		.17	
150-160 vis., D color, Bright Stocks 0-10 c.t.	.12½	.14	.12½	.14	.12½	.14
150-160 vis., D color, Bright Stocks 10-25 c.t.	.12½	.13	.12½	.13	.12½	.13
150-160 vis., D color, Bright Stocks 25-40 c.t.	.12¼	.13	.12¼	.13	.12¼	.13
150-160 vis., E color, Bright Stocks	.12	.12½	.12	.12½	.12	.12½
Waxes:						
124-126 White Crude Scale Wax	.01¾	.02	.01¾	.02	.01¾	.02

All bright stock prices are for domestic movement.

PENNSYLVANIA—						
34 Neutral	.05½		.05½		.05½	
34 Sundebloom	.05		.05		.05	
36 Miners' Neutral	.05½		.05½		.05½	
150, 3 color	.15¼	.15½	.15¼	.15½	.15¼	.15½
180, 3 color	.18	.18½	.18	.18½	.18	.18½
200, 3 color	.21		.21		.21	
220, 3 color	.23¼	.26½	.23¼	.26½	.23¼	.26½
600, steam refined	.07½	.08	.07½	.08	.07½	.08
650, steam refined	.10	.11	.10	.11	.10	.11
600, Pennsylvania Flash	.11½	.12½	.11½	.12½	.11½	.12½
600, E filtered	.11	.12	.11	.12	.11	.12
600, D filtered, Oil City	.16		.16		.16	
Pennsylvania Bright Stocks below 35 c.t.	.16¼	.16½	.16¼	.16½	.16¼	.16½
Pennsylvania Bright Stocks above 35 c.t.	.16		.16		.16	
*122-124 White Crude Scale Wax	.02		.02		.02	
124-126 White Crude Scale Wax	.02		.02		.02	

*At New York.

GULF COAST (South Texas)—						
100 vis., 2-2½ color, pale oil	.05½		.05½		.05½	
200 vis., 3 color, pale oil	.07½	.07¾	.07½	.07¾	.07½	.07¾
300 vis., 3 color, pale oil	.08¾	.09	.08¾	.09	.08¾	.09
500 vis., 3½ color, pale oil	.10	.10½	.10	.10½	.10	.10½
750 vis., 3½ color, pale oil	.11½	.12	.11½	.12	.11½	.12
1,200 vis., 3½ color, pale oil	.14	.14½	.14	.14½	.14	.14½
2,000 vis., 4 color, pale oil	.15	.15½	.15	.15½	.15	.15½
200 vis., 5-6 color, red oil	.06¾	.07	.06¾	.07	.06¾	.07
300 vis., 5-6 color, red oil	.08	.08½	.08	.08½	.08	.08½
500 vis., 5-6 color, red oil	.09¼	.09¾	.09¼	.09¾	.09¼	.09¾
1,200 vis., 5-6 color, red oil	.13	.13½	.13	.13½	.13	.13½
2,000 vis., 6 plus color	.15	.15½	.15	.15½	.15	.15½
CALIFORNIA—						
130 vis., 2½-3 color	.08	.08½	.08	.08½	.08	.08½
200 vis., 2½-3 color	.09	.10	.09	.10	.09	.10
300 vis., 3-3½ color	.10	.11	.10	.11	.10	.11

REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

350 vis., 3½-4 color	.11	.12	.11	.12	.11	.12
400 vis., 3½-4 color	.12	.12½	.12	.12½	.12	.12½
Red Neutral:						
200 vis., 4½-5 color	.09½	.10	.09½	.10	.09½	.10
300 vis., 5-6 color	.10¼	.10¾	.10¼	.10¾	.10¼	.10¾
400 vis., 5-6 color	.11	.12	.11	.12	.11	.12
500 vis., 4½-5 color	.12¼	.13	.12¼	.13	.12¼	.13
500 vis., 5-6½ color	.12		.12		.12	
600 vis., 6½ plus color	.13	.14	.13	.14	.13	.14
700 vis., 6½ plus color	.14	.15	.14	.15	.14	.15

Note—Bright stocks are not manufactured commercially on the Pacific Coast.

NEW YORK (BAYONNE) REFINERY PRICES

	July 7		June 30		June 23	
Gasoline, U. S. Motor, 58-60, 437 e.p.	.05½	.05¾	.05½	.05¾	.05½	.06¼
Kerosene, water white, 41-43	.04¾		.04¾		.04¾	.05
*Fuel Oil, Bunker "C," 41-43	.85		.85		.85	
†Fuel Oil, Diesel, 28-30, per bbl.	1.55		1.55		1.55	
Gas Oil, 28 gravity plus	.04		.04		.04	
25 pale Paraffin Oil, tank car	.10¼		.10¼		.10¼	
28 pale Paraffin Oil, tank car	.07¼		.07¼		.07¼	
280 red Paraffin Oil, tank car	.12½		.12½		.12½	
250 red Paraffin Oil, tank car	.11½		.11½		.11½	
225 red Paraffin Oil, tank car	.10		.10		.10	
200 red Paraffin Oil, tank car	.09¼		.09¼		.09¼	
Domestic heating oil, min. 32 grav., tank car	.04		.04		.04	
Refined Wax:						
120-122 a.m.p., per lb.	.02⅞		.02⅞		.02⅞	
125-127 a.m.p., per lb.	.03⅛		.03⅛		.03⅛	
130-132 a.m.p., per lb.	.03⅝		.03⅝		.03⅝	
133-135 a.m.p., per lb.	.04		.04		.04	
135-137 a.m.p., per lb.	.04½		.04½		.04½	
Petrolatum in barrels in carload lots, per pound:						
Dark Green	.01⅝		.01⅝		.01⅝	
Amber	.02⅛		.02⅛		.02⅛	
Extra Amber	.02⅞		.02⅞		.02⅞	
Cream	.05⅝		.05⅝		.05⅝	
Lily White	.06½		.06½		.06½	
Snow White	.07		.07		.07	

*Lighterage 5 cents a barrel extra. †Lighterage 6.5 cents a barrel.

NEW YORK (BAYONNE) EXPORT PRICES

	July 7		June 30		June 23	
600, steam refined cylinder stocks, in bbls.	.15½	.16	.15½	.16	.15¾	.16
635, steam refined	.16¼	.16½	.16¼	.16½	.16¼	.16½
650, steam refined	.18¾	.19	.18¾	.19	.18¾	.19
600, Pennsylvania Flash	.19½	.20	.19½	.20	.19½	.20
630, Pennsylvania Flash	.25¾	.26	.25¾	.26	.25¾	.26
600, Warren E	.19	.20	.19	.20	.19	.20
600, Oil City E	.18	.18½	.18	.18½	.18	.18½
Light 140-150 Bright Stocks	.24¼	.24½	.24¼	.24½	.25	.26
Dark 140-150 Bright Stocks	.23½	.24	.23½	.24	.24	.25

LOS ANGELES EXPORT PRICES

	July 7		June 30		June 23	
Kerosene, water white	.04½	.06	.04½	.06	.04½	.06
*U. S. Motor gasoline, 53-55, 437 e.p.	.05	.06½	.05	.06½	.05	.06½
*58-60, 400 endpoint gasoline	.05½	.06½	.05½	.06½	.05½	.06½

*For coastwise shipments.

CRUDE OIL PRICES

OKLAHOMA, KANSAS, NORTH AND EAST CENTRAL TEXAS

East Texas (June 20)† ..... $ .20
Rusk County, Tex. (April 6, 1931)* ..... .25
Corsicana heavy (June 3, 1931)† ..... .22
Other fields ..... See gravity table

*Posted by Panola Pipe Line Co. ‡Posted by Magnolia Petroleum Co., June 20; Stanolind Oil & Gas Co., June 25. †Posted by Magnolia Petroleum Co.

TEXAS PANHANDLE

Gray County, Wheeler County and Carson-Hutchinson Counties. See gravity table

WEST TEXAS

Iatan and Westbrook. Same as North Texas
Crane, Upton, Crockett, Howard, Glasscock, Ector, Winkler and Pecos Counties* ..... $ .25
Lea County, N. Mex.† ..... .25

*The Texas Company, June 2, 1931. All other companies, June 3, 1931. †The Texas Company, June 2, 1931. All other companies, June 3, 1931.

GULF COAST

Grade A and Grade B classifications discontinued ..... See gravity table
Jennings, La. (June 3, 1931)* ..... $ .40
Lockport, La. (June 3, 1931)† ..... See Gulf Coast gravity table
Refugio light ..... See gravity table
Refugio heavy‡ ..... .44
Markham (June 3, 1931)§ ..... .37
High Island (June 3, 1931)¶ ..... .40

*Gulf Refining Co. †Vacuum Oil Co. ‡Humble Oil & Refining Co. §The Texas Company. ¶Gulf Pipe Line Co.

EASTERN STATES

Joseph Seep Purchasing Agency
(Effective June 3, 1931)

Penna Grade Oil in National Transit Lines (Pennsylvania) $1.50
Pennsylvania Grade Oil in Southwest Pennsylvania Lines 1.35
Penna Grade Oil in Eureka Pipe Line Lines (West Virginia) 1.35
Penna Grade Oil in Buckeye Pipe Line Lines (Ohio) 1.00
Corning Grade Oil in Buckeye Pipe Line Co.'s Line ..... .65
Ragland Grade Oil in Cumberland Pipe Lines (Kentucky) (Jan. 10, 1931) ..... .60
Wayne District Oil in Cumberland Pipe Lines (April 23, 1931) 1.17

ARKANSAS

Smackover, Ark. (all grades) (June 2, 1931)* ..... $ .37
Smackover, Ark. (all grades) (June 3, 1931)† ..... .26
Bellevue, La. (June 3, 1931) ..... .25
Urania (June 3, 1931) ..... .30
Calion, Ark., heavy (June 3, 1931) ..... .37
East El Dorado, Ark. (June 3, 1931) ..... .25
Stephens, Ark. (June 3, 1931) ..... .20
Other fields ..... See gravity table

*Posted by The Texas Company on June 2, 1931, and by Gulf Refining Co. on June 3. †Posted by Standard Oil Co. of Louisiana and Magnolia Petroleum Co. on June 3. Bellevue posted by Standard Oil Co. of Louisiana and Magnolia Petroleum Co.; Urania by Louisiana Oil Refining Co. Calion by Gulf Refining Co.; East El Dorado by Gulf Refining Co. and Magnolia Petroleum Co. Stephens posted by Louisiana Oil Refining Co. and Atlantic Oil Producing Co.

SOUTH CENTRAL AND SOUTHWEST TEXAS

Darst Creek (June 2, 1931)* ..... $ .37
Luling (June 3, 1931)† ..... .25
Mirando (June 3, 1931)‡ ..... .44
Pettus (June 3, 1931)‡ ..... .50
Salt Flat (June 3, 1931)‡ ..... .37
Thrall§ ....
Lytton Springs (Lockhart) See gravity table

(Continued on Page 110)

CRUDE OIL GRAVITY TABLE

	1 Okla., Kans., North and Central Texas East Central Texas	2 N. La.-Ark.	3 Carson and Hutchinson Counties, Tex.	4 Gray County, Texas	5 Salt Creek, Wyo.	6 Gulf Coast
Below 25 degrees	...	...	...	...	...	.44
25 to 25.9	...	...	...	...	...	.45
26 to 26.9	...	...	...	...	...	.46
27 to 27.9	...	...	...	...	...	.47
28 to 28.9	...	...	...	...	...	.48
Below 29	.25	.25	...	...	...	...
29 to 29.9	.26	.26	...	...	.26	.49
30 to 30.9	.27	.27	...	...	.27	.50
31 to 31.9	.28	.28	...	...	.28	.51
32 to 32.9	.29	.29	...	...	.29	.52
33 to 33.9	.30	.30	...	...	.30	.53
34 to 34.9	.31	.31	...	...	.31	.54
Below 35	...	...	.21	.24	...	...
35 to 35.9	.32	.32	.22	.25	.32	.55
36 to 36.9	.33	.33	.23	.26	.33	.56
37 to 37.9	.34	.34	.24	.27	.34	.57
38 to 38.9	.35	.35	.25	.28	.34	.58
39 to 39.9	.36	.36	.26	.29	.34	.59
40 and over	.37	.37	.27	.30	.34	.60

Note—On June 20, the Magnolia Petroleum Co. gave notice that effective at 7 a.m. on that day and until further notice, its prices on crude oil in the States of Oklahoma, Kansas, Texas, Louisiana and Arkansas, where it had been purchasing on a gravity basis, would be as follows per barrel at the well: North and Central Texas, including Burkburnett, Archer, Stephens, Henrietta, Electra, Comanche and Olden, 35 cents; East Texas, 20 cents; Thrall, 35 cents; East Central Texas, including Mexia, Wortham, Corsicana light, 34 cents; Panola County and Lytton Springs, 34 cents; Gray County, Texas Panhandle, 30 cents and Carson and Hutchinson Counties, Texas Panhandle, 26 cents; Oklahoma: Cushing, Yale, Oklahoma City, Morrison, Wewoka and Seminole, 36 cents; Cement, Duncan and Walters, 32 cents; Hewitt and Graham, 28 cents; Healdton, 25 cents. Kansas: Augusta, 30 cents, North Louisiana: Bull Bayou, 36 cents; Haynesville, 27 cents; Pine Island, 32 cents; Cotton Valley, 25 cents. Arkansas: El Dorado and Rainbow, 25 cents.

Column 1—Stanolind Crude Oil Purchasing Co., H. F. Wilcox Oil & Gas Co., Sinclair Refining Co., Barnsdall Refineries, Inc., Mid-Continent Petroleum Corp., Champlin Refining Co., Mid-Kansas Oil & Gas Co., Eason Oil Co., Standard Oil Co. of Kansas, Continental Oil Co., Pure Oil Co., Tidal Oil Co., Tidal Western Oil Co. and Empire Pipe Line Co., all on June 1. Magnolia Petroleum Co. on June 2, with the exception that Magnolia posted below 26 degrees at 22 cents; 26-26.9 at 23 cents; 27-27.9, 24 cents. The Empire Pipe Line Co. adopted the Magnolia's schedule on lower grades in Carter County, Oklahoma. The Texas Company adopted Stanolind schedule on June 2, Gypsy Oil Co., June 2; Gulf Pipe Line Co., June 3; and Humble Oil & Refining Co., June 3.

Column 2—The Texas Company, June 2; Standard Oil Co., Magnolia Petroleum Co. and Gulf Refining Co., June 3.

Column 3—The Texas Company, June 2, 1931; Humble Oil & Refining Co., Gulf Pipe Line Co., Continental Oil Co. and Magnolia Petroleum Co., June 3.

Column 4—The Texas Company, June 2; Humble Oil & Refining Co., Gulf Pipe Line Co., Magnolia Petroleum Co., and H. F. Wilcox Oil & Gas Co., June 3.

Column 5—Midwest Refining Co., June 1.

Column 6—Posted by The Texas Company, June 2; Gulf Pipe Line Co., Humble Oil & Refining Co., Vacuum Oil Co. Sun Oil Co. posted same prices on June 3 up to and including 35 gravity at 55 cents, but will pay only 55 cents for all oil above 36 gravity.

CALIFORNIA CRUDE OIL PRICES

STANDARD OIL CO. OF CALIFORNIA

For its current purchases of crude oil at the well (unless otherwise specified) for allowable crude oil produced in accordance with allocations made by the California Statewide Curtailment Committee. All gravities above those quoted take highest price offered in that field. **Effective June 19, 1931, at 7 a. m.**

Gravity	Signal Hill	Seal Beach, Alamitos Heights	Huntington Beach	Inglewood	Olinda-Brea Canon	Torrance	Richfield	Coyote Hills	Santa Fe Springs	Midway-Sunset Elk Hills, Buena Vista Hills	Lost Hills
14-14.9	$.65	$.65	$.65	$.65	$.65	$.65	$.65	$.65	...	$.55	$.55
15-15.9	.65	.65	.65	.65	.65	.65	.65	.65	...	.55	.55
16-16.9	.65	.65	.65	.65	.65	.65	.65	.65	...	.55	.55
17-17.9	.65	.65	.65	.65	.65	.65	.65	.65	...	.55	.55
18-18.9	.65	.65	.65	.65	.65	.65	.65	.65	...	.55	.55
19-19.9	.65	.65	.65	.65	.65	.65	.65	.65	...	.55	.55
20-20.9	.65	.65	.65	.66	.66	.65	.65	.65	...	.55	.55
21-21.9	.65	.65	.65	.68	.67	.65	.66	.65	...	.55	.57
22-22.9	.65	.65	.66	.70	.68	.66	.68	.65	...	.58	.59
23-23.9	.67	.67	.68	.72	.70	.67	.70	.66	...	.58	.60
24-24.9	.69	.69	.70	.74	.72	.68	.72	.67	$.65	.61	.62
25-25.9	.71	.71	.72	.76	.74	.70	.74	.69	.65	.64	.64
26-26.9	.73	.73	.74	...	.76	...	...	.71	.65	.66	.66
27-27.9	.75	.75	.76	...	.78	...	...	.73	.68	.68	.67
28-28.9	.77	...	...	...	.80	...	...	.75	.71	.71	.69
29-29.9	.79	...	...	...	...	...	...	.77	.73	.74	.71
30-30.9	.81	...	...	...	...	...	...	.79	.75	.76	.73
31-31.9	...	...	...	...	...	...	...	...	.78	...	...
32-32.9	...	...	...	...	...	...	...	...	.80	...	...
33-33.9	...	...	...	...	...	...	...	...	.83	...	...
34-34.9	...	...	...	...	...	...	...	...	.85	...	...
35-35.9	...	...	...	...	...	...	...	...	.87	...	...

Standard Oil Co. of California prices in other fields:
Wheeler Ridge—55 cents per barrel for all grades (14° to 25.9°).
Coalinga—55 cents for all grades from 14° to 24.24.9°; 57 cents for 25 gravity.
Newhall, McKittrick and Kern River—55 cents for all grades (14° to 19.9°).
Montebello—65 cents for all grades (14° to 25.9°).
Whittier and LaHabra—65 cents for all grades (14° to 22.9°).
Elwood Terrace, f.o.b. ship—33° to 33.9°, 79 cents; 34° to 34.9°, 81 cents; 35° to 35.9°, 84 cents; 36° and above, 87 cents.
Playa Del Rey: Prices subject to field gathering charge of 5 cents per barrel—19° to 19.9°, 65 cents; 20° to 20.9°, 65 cents; 21° to 21.9°, 66 cents; 22° to 22.9°, 67 cents; 23° to 23.9°, 68 cents; 24° to 24.9°, 67 cents; 25° and above, 68 cents.

ASSOCIATED OIL CO. PRICES

Associated Oil Co. prices, effective June 20, are as follows:
Ventura Avenue, 22 gravity, 58 cents, with 2 cents added for each degree upward to and including 30 gravity, which is 74 cents.
Kettleman Hills, 30 gravity and above, 66 cents.
Potrero, 24 gravity, 59 cents, with 2 cents added for each degree upward to 34 gravity, which is 69 cents.

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TANK WAGON MARKETS

Tank wagon quotations for gasoline and kerosene in United States as furnished by the larger marketing concerns July 7

ALL TANK WAGON AND SERVICE STATION QUOTATIONS INCLUDE TAXES

STANDARD OIL CO. (INDIANA)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Chicago	14 0	14 0	3.0	9 0
Decatur, Ill.	14 4	14 4	3 0	9 0
E. St. Louis	13.7	13.7	3.0	8.2
Joliet	14.4	14 4	3.0	9 0
Peoria	14 4	14.4	3 0	9 0
Quincy	14 2	14 2	3.0	8.8
Davenport, Ia.	14 5	14.5	3 0	9.3
Des Moines	14 5	14.5	3.0	9 3
Keokuk	14 5	14.5	3 0	9 3
Sioux City	14 1	14.1	3 0	8.9
Duluth, Minn.	15.5	15.5	3 0	9.9
Mankato	15 1	15 1	3.0	9.7
Minneapolis	15 3	15 3	3 0	9.9
La Crosse, Wis.	16 2	16 2	4 0	10.0
Milwaukee	15 1	15.1	4 0	9.9
Madison	15.3	15 3	4.0	9.1
Detroit, Mich.	14 8	14 8	3.0	10 7
Grand Rapids	14 7	14 7	3.0	10 6
Saginaw	14.9	14 9	3 0	10 8
Evansville, Ind.	15.1	15 1	4.0	9 9
Indianapolis	15 3	15.3	4 0	10.1
South Bend	15.4	15 4	4 0	10 2
Fargo, N. D.	16 9	16 9	3.0	11 9
Huron, S. D.	16.5	16 3	4.0	10.7
Sioux Falls	15.5	15.3	4 0	10 4
K. C., Mo.	13 9	13.9	3 0	7 6
Springfield*	13.9	13 9	3 0	8.5
St. Louis*	13.9	13 9	2.5	8 3
St. Joseph	13 5	13.5	3.0	7 5
Wichita, Kans.	13.3	13 3	3 0	7 3
Bartlesville, Ok.	13.0	13.0	5.0	7.5

*State tax 2 cents, remainder city tax.

A third grade of gasoline, "Stanolind Blue," is sold at all major points at a price 2 cents or more below the price on the regular grade.

Effective April 15—Discounts on Q.D.A. on 1,000 gallons or more per month throughout territory: Red Crown Ethyl Gasoline, 3 cents off tank wagon price; Red Crown gasoline, 2½ cents off tank wagon price; Stanolind Blue gasoline, 1 cent off tank wagon price.

Discount in Chicago division on 1,000 gallons or more per month: Red Crown Ethyl Gasoline, 4 cents off tank wagon price; Red Crown gasoline, 3½ cents off tank wagon price; Stanolind Blue gasoline, 2 cents off tank wagon price.

Discounts on resellers authorized agent's agreement: Same amounts as above except made off service station price instead of tank wagon price.

PACIFIC COAST TERRITORY

	Gasoline: Wh'ls'e price	Gasoline: Retail* price	Gasoline: Incl'ds tax of	Kero. tank wagon
Fresno	19.5	16.5	3.0	17.0
San Francisco	19.5	16.5	3.0	15.5
Los Angeles	19.0	16 0	3.0	15.5
Reno, Nev.	23 5	20 5	4 0	19 0
Portland, Ore.	21.0	18.0	4.0	16.5
Seattle, Wash.	22.0	19.0	5.0	16.5
Tacoma	22.0	19 0	5 0	16.5
Spokane	23 5	20.5	5.0	20 5
Phoenix, Ariz.	15 5	17.5	5 0	20 0

Above prices are at company's plant or depots as company does not operate stations. A 4-cent per gallon discount is given dealers and customers taking tank wagon lots except in Phoenix where the discount is 3 cents plus a 2-cent special temporary discount subject to withdrawal at any time.

*Retail prices posted by Standard Stations, Inc., a subsidiary.

SOUTHWESTERN DISTRICT

Magnolia Petroleum Co.

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Dallas, Tex.	13 0	14.0	4.0	8.0
Fort Worth	11.0	12.0	4 0	8.0
Houston	12.0	14 0	4 0	11 0
San Antonio	12 0	14.0	4.0	10.0
El Paso	13 0	15 0	4 0	12.0
Texarkana	16 0	16.0	4 0	11.0
Muskogee, Ok.	13 0	14.0	5.0	8 0
Okla. City	11.0	13.0	5.0	7.0
Tulsa	11 0	13.0	5.0	8.0
Ft. Smith, Ark.	14 0	14.0	5 0	11 0
Little Rock	15.5	16.0	6.0	11.0

One-cent rebate made from posted station prices to cash purchasers in Louisiana, Arkansas and Tennessee.

NEBRASKA

Standard Oil Co. (Nebraska)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Omaha	12 9	12 9	4.0	9.25
McCook	16.0	17.75	4 0	10 75
Norfolk	15 75	16.75	4 0	9 75
N. Platte	16.75	17.75	4.0	10 50
Scottsbluff	16.0	16.0	4.0	10 25

Note—Dealers' discounts allowed as follows: Red Crown Ethyl, 3 cents off station price; Red Crown, 2½ cents off station price; third grade, 1 cent off station price.

SOUTHERN DISTRICT

Standard Oil Co. (Kentucky)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Atlanta, Ga.	14.0	16.0	6.0	12.5
Augusta	18.0	20 0	6 0	14.0
Macon	16 0	18 0	6.0	12 0
Savannah	16 0	18.0	6.0	12 0
Birm'ham, Ala.	14 0	16.0	5.0	13 0
Mobile	16 0	18 0	4.0	13 0
Montgomery	16.0	18.0	4.0	13.5
Clarks'le, Miss.	18 0	20 0	5 0	13 5
Jackson	16 0	18 0	5 0	11 5
Natchez	18.0	20 0	5 0	13 5
Gulfport	16 0	16 0	5.0	13.5
Vicksburg	16.0	16.0	5 0	11.5
Jack'ville, Fla.	17 0	18 0	6 0	12 0
Miami	18 0	20.0	6 0	13.0
Pensacola	19 0	20.0	6 0	13 0
Tampa	17 0	18 0	5.0	12.0
Lexington, Ky.	17 0	18 0	5 0	12 0
Covington	16 0	17.0	5 0	11.0
Louisville	16 0	17.0	5.0	11 0
Ashland	17 0	19.0	5.0	13 0
Paducah	17.0	18.0	5 0	11 0
Bowling Green	19 0	21.0	5 0	14.5
Corbin	18 0	19 0	5.0	15.0

A third grade, "Kyso Green," is sold at a price generally 2 cents below the price on the regular grade.

In addition to the state tax of 4 cents on gasoline, Montgomery has city tax of 1 cent on gasoline and one-half cent on kerosene. Kerosene prices in Georgia include 1-cent tax. In Florida, an inspection fee of 0.125 cent; in Alabama, an inspection fee of one-half cent on kerosene and one-fourth cent on gasoline. To Pensacola, Montgomery, Birmingham and Mobile state taxes add 1-cent levy tax. To Gulfport state tax add privilege tax of 2 cents.

Effective April 2, price to dealers 2 cents under posted tank wagon price.

CENTRAL SOUTH DISTRICT

Standard Oil Co. (Louisiana)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
N. Orleans, La.	15 5	16 5	6.0	12.0
Baton Rouge	14.5	15.5	5 0	12.0
Alexandria†	15 5	16 5	6.0	12.0
Lafayette*	15.5	16 5	6 0	12 0
Lake Charles*	15.5	16 5	6.0	12 0
Shreveport	14 5	15 5	5.0	12 0
Knoxville, Tenn.	18 0	19.0	6 0	12 5
Memphis	14 0	15 0	6 0	10.0
Chattanooga	17 5	18 5	6 0	12 9
Nashville	17.0	18 0	6.0	12.5
Bristol	17.5	18.5	6 0	14 0
Lt. Rock, Ark.	15 5	16.0	6.0	11.0

*Includes city tax of 1 cent. Louisiana kerosene prices include 1-cent state tax. New Orleans kerosene price also includes 1-cent city tax.

†Gasoline price at Alexandria includes 1-cent tax in parish of Rapides.

Two-cent discount off gasoline and kerosene tank wagon price to dealer and commercial accounts.

PENNSYLVANIA-DELAWARE AND PART OF NEW ENGLAND

Atlantic Refining Co.

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Pittsburgh, Pa.	*11 0	*13.0	...	12 0
Philadelphia	*11.0	*13 0	...	12 0
Scranton	*11.0	*13 0	...	12 0
Allentown	*11.0	*13 0	...	12 0
Altoona	*11 0	*13 0	...	12 0
Erie	*11.0	*13 0	...	12.0
Dover, Del.	14 0	16.0	3 0	12 0
Wilmington	14.0	16 0	3 0	12 0
Spring'd, Mass.	15 5	17 5	3 0	10 0
Fall River	15.0	17.0	3 0	11.0
Worcester	15.3	17.3	3.0	11 0
Boston	14.5	16.5	3 0	11 0
Providence, R.I.	12 5	14 5	2 0	10 0
Hartford, Conn.	14.5	16.5	2 0	10 0
New Haven	14 6	16.6	2 0	10.0

*Does not include tax of 2 cents in Pennsylvania. Pennsylvania tax is collected by the dealer and paid by him direct to the State. Atlantic Refining Co. recognizes a 2-cent per gallon discount on gasoline from its posted tank wagon markets on sales to dealers for purpose of resale. Atlantic Refining Co. also recognizes a maximum discount of 2 cents per gallon on gasoline to commercial accounts under contract for one year.

OHIO

Standard Oil Co. (Ohio)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Ohio points	15.0	16.0	4 0	*13 0

Dealers and commercial accounts 2 cents under tank wagon.

*Service station price 13.0 cents.

NEW YORK AND PART OF NEW ENGLAND DISTRICT

Standard Oil Co. (New York)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Albany, N. Y.	16 6	17 6	2.0	15 6
New York*	15 3	15 3	2.0	14.3
Buffalo	15 8	15.8	2 0	14 8
Rochester	16.0	16 0	2 0	14.0
Syracuse	16 8	16 8	2.0	14.8
Boston, Mass.	16.5	16 5	2 0	13.5
Augusta, Me.	18.3	18 3	4 0	14 3
Manch'tr, N. H.	18.4	18 4	4 0	14.0
Burlington, Vt.	19 3	19.3	4.0	15 3

*Prices in steel barrels.

ATLANTIC COAST DISTRICT

Standard Oil Co. (New Jersey)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Atl'tic City, N.J.	13.7	15 7	3 0	10.5
Newark	12 7	14 7	3 0	9 5
Annapolis, Md.	15.2	16 2	4.0	10 0
Baltimore	14 4	15 4	4.0	8.5
Cumberland	16.2	17 2	4 0	11.0
Wash'gton, D.C.	12 9	13 9	2 0	9 7
Danville, Va.	17 0	18.0	5 0	10.5
Norfolk	15.5	16.5	5 0	9 3
Petersburg	16.5	17.5	5.0	10 3
Richmond	15 9	16 9	5 0	9 7
Roanoke	17.3	18 3	5.0	11 0
Charles'n, W.Va.	15 7	16 7	4 0	10.5
Keyser	16.3	17.3	4 0	11.1
Parkersburg	14 4	15 4	4 0	9 3
Wheeling	15.6	16 6	4.0	10.4
Charlotte, N. C.	13 5	17 0	6 0	11 3
Hickory	15.8	19.8	6 0	11 6
Mt. Airy	18.7	19 7	6 0	11 5
Raleigh	18.4	19 4	6 0	11 2
Salisbury	18 7	19.7	6 0	11 5
Charleston, S.C.	16 5	17.5	6 0	9 3
Columbia	18 4	19 4	6.0	11 2

A 2-cent per gallon discount off the gasoline tank wagon price is offered to dealers except in Washington, D. C., and in Maryland where discount is 3 cents.

ROCKY MOUNTAIN DISTRICT

Continental Oil Co.

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Denver, Colo.	14 0	17 0	4 0	12.5
Pueblo	14.0	17 0	4 0	12 0
Grand Junction	16 0	16 0	4.0	14 5
Casper, Wyo.	15 0	18 0	4 0	10.0
Cheyenne	16 0	19.0	4 0	11 5
Butte, Mont.	17.0	20 0	5 0	16 0
Billings	20.0	23 0	5 0	14.5
Great Falls	20 0	23.0	5 0	16 0
Helena	20 0	23 0	5 0	16 0
Salt Lake, Utah	14.0	17.0	4 0	14 0
Albu'que, N.M.*	17 0	21 0	4.0	14.0
Boise, Idaho†	19 0	22 0	5.0	15 0
Twin Falls‡	18.0	....	5.0	18.0

*One-cent excise city tax. †Less 1 cent to dealers. ‡Less 3 cents to dealers.

NAPHTHA

	Tank wagon	Tank car
Oleum spirits	12.0	8.0
V.M.&P. naphtha	14 0	9.5
Cleaners' naphtha	16 2	11 0
Stanisol	16.2	11.0

Tank wagon prices f.o.b. Chicago; tank car prices f.o.b. Whiting.

STANOLIND FURNACE OIL IN CHICAGO

All dumps of 50 gallons or more.....$0.07

Note—Outside Chicago furnace oils discount of 1 cent per gallon is given on deliveries of 100 to 349 gallons and 1½ cents on deliveries of 350 gallons or more.

TANK WAGON CHANGES

Continental Oil Co. reduced the gasoline tank wagon and station price 1½ cents in Salt Lake City, Utah, to 14 and 17 cents June 26. On June 11 the gasoline station price was reduced 3 cents to 16 cents in Grand Junction, Colo.

Atlantic Refining Co. reduced the gasoline tank wagon and station prices at Providence, R. I., to 12.5 and 14.5 cents June 26. On June 23 the kerosene price was reduced 1 cent to 10 cents in Springfield, Mass.

Standard Oil Co. (Kentucky) reduced the gasoline tank wagon and station prices 2 cents in Atlanta, Ga., to 14 and 16 cents.

Standard Oil Co. of Louisiana advanced the gasoline tank wagon and station prices 1 cent throughout Tennessee on July 1 to equalize the increase in the state tax from 5 to 6 cents. On June 24 the kerosene price was reduced 1 cent in Chattanooga, Tenn., to 12 cents.

Standard Oil Co. of California through its subsidiaries advanced the gasoline

(Continued on Page 120)

CRUDE OIL PRICE CHANGES

The Sinclair Refining Co. on July 3 and the Gulf Pipe Line Co. on July 6 withdrew their posted price in East Texas. They had been paying 20 cents per barrel for a short period.

CRUDE OIL PRICES

(Continued from Page 109)

Dobrowolski (Oct. 25, 1930)‡ .. ..
Same as Mid-Continent gravity scale up to and including 38-38.9°
Somerset ... .
Same as Mid-Continent gravity scale up to and including 38-38.9°

*The Texas Company. †Magnolia Petroleum Co. ‡Humble Oil & Refining Co. §Thrall prices same as North Central Texas less 19½ cents per cwt. freight. ¶Grayburg Oil & Refining Co., Pioneer Oil & Refining Co. and Texas Petroleum Products Co. ‖Pioneer Oil & Refining Co.

ROCKY MOUNTAIN STATES
Ohio Oil Co.—Midwest Refining Co.

Iles (Mar. 7, 1931):
33 gravity and above ..... $ .72
Under 33 gravity ..... .50
Fort Collins (June 2, 1931) ..... .30
Florence (June 2, 1931) ..... .27
Wellington (June 2, 1931) ..... .25
Dutton Creek (Oct. 28, 1930) 1.01
Rock Creek, Wyo. (June 2, 1931) ..... .45
Frannie, light (June 2, 1931) ..... .35
Frannie, heavy (June 2, 1931) ..... .25
Salt Creek .....Mid-Continent gravity table
Big Muddy (June 2, 1931) ..... .40
Grass Creek, heavy (June 2, 1931) .... .62
Grass Creek, light (June 2, 1931) ..... .62
Elk Basin (June 2, 1931) ..... .62
Lance Creek (June 2, 1931) ..... .75
Poison Spider (Mar. 5, 1931) ..... .70
Notches (Mar. 14, 1927) ..... .65
Hudson (June 2, 1931) ..... .65
Lander (Mar. 5, 1931) ..... .40
Rex Lake (Feb. 22, 1930) 1.10
Osage (Apr. 15, 1931) ..... .98
Lost Soldier (Mar. 5, 1931) ..... .55
Hamilton Dome (Mar. 14, 1927) ..... .85
Greybull (Oct. 28, 1930) 1.35
Torchlight (Oct. 28, 1930) 1.25
Cat Creek (June 3, 1931) ..... .60
Ponders, Mont. (June 3, 1931) ..... .75
Sunburst, Mont. (June 3, 1931) ..... .85
Hogback, N. Mex. (June 3, 1931) ..... .65
Artesia, N. Mex. (June 3, 1931) ..... .25
Lea County, N. Mex. (June 3, 1931) .. .25
Border, Mont. 1.55
Red Coulee, Alberta 1.55

Note—Salt Creek, Cat Creek, Dallas-Derby, Hudson, Greybull and Hogback posted by Midwest Refining Co. and the remainder by the Ohio Oil Co. Both companies posted Grass Creek light and Elk Basin. Lost Soldier posted by Producers & Refiners Corp. Artesia posted by Continental Oil Co. Border and Red Coulee posted by Imperial Refining Co. Ohio Oil Co. ceased posting Artesia on March 5, 1931. Lea County posted by Humble Oil & Refining Co. Fort Collins, Wellington, Orchard, Florence, Rattlesnake and Table Mesa by the Continental Oil Co. Osage posted by Arro Oil & Refining Co.

MIDDLE WESTERN STATES
Ohio Oil Co.
(Effective June 2, 1931)

Lima ..... $ .70
Wooster ..... .72
Illinois ..... .55
Indiana ..... .35
Princeton ..... .55
Plymouth .....Shut in
Western Kentucky ..... .50
Midland, Mich.* (June 1, 1931) ..... .52
Dundee, Mich.† .....
Same as Stanolind Crude Oil Purchasing Co.'s Mid-Continent gravity scale
Upper and Lower Traverse Sands, Mich.†
....Same as Mid-Continent gravity scale
Somerset, Ky. (June 5, 1931) ..... .55
Oil City, Ky. (June 6, 1931) ..... .50
Petrolia (Canada) (June 4, 1931)¶ 1.50
Oil Springs (Canada) (June 4, 1931)¶.. 1.62
Alberta (Canada)‖:
50° and above (Mar. 1, 1931) 2.35
45 to 45.9° (Mar. 1, 1931) 1.87

*Posted by Pure Oil Co. †Posted by Standard of Indiana for boat shipment. ‡Posted by Stoll Refining Co. §Posted by Imperial Oil, Ltd. ¶Posted by Imperial Oil, Ltd. and Regal Oil & Refining Co. of Calgary, Somerset, Ky., crude purchased by Ashland Refining Co., Ashland, Ky., and delivered through Cumberland Pipe Line.

Tide Water Pipe Co.
Bradford district (June 3, 1931) $1.75
Allegany district (June 3, 1931) 1.75

Pure Oil Co.
Cabin Creek, W. Va. (June 3, 1931) ..$1.35
Kelly Creek, W. Va. (June 3, 1931) .. 1.35
Bradford Hollow, W. Va. (June 3, 1931) 1.35

MEXICAN CRUDE

Panuco* ..... $ .44

*F.o.b. ship, based on May transactions and exclusive of taxes and bar dues.

Of Interest to Sales Departments

Excess of Imports Disturbing Market Throughout India

NEW YORK, July 3.—Overproduction of petroleum in other parts of the world has reacted strongly against the market in India, which has been compelled to absorb large quantities of low priced kerosene and other products from other countries, according to Sir John T. Cargill, chairman of the Burmah Oil Co., Ltd., in his annual report. The petroleum industry in India, he said, has studiously refrained from participating in the general orgy of overproduction which has characterized the operations of petroleum interests in other countries, and notwithstanding its conservation activities, has been penalized through excessive competition from countries which have been overproducing.

Reporting to stockholders of the company, Sir John says, in part: "In the past year we had to face—as we still have—reduced values for the whole of our kerosene production, other than our price restriction policy volume, owing to the halving under the Indian budget of the difference between the import and excise duties on that product. And on top of this, in the autumn, the increasing disparity between world production and consumption of petroleum forced further falls in values throughout the world, which the market in India could not and did not escape.

Imports Gain

"Despite a definite setback in India in the demand for kerosene and a marking of time in that for petrol, we see imports from Russia and America if anything greater than before. Our arrangements with our friends the Anglo-Persian Oil Co., Ltd., and the Royal Dutch-Shell group have until recently provided us with the necessary breathing space, as their imports have gradually dropped out to yield to the indigenous production of the outlet in India it has required. That margin has now, however, been exhausted, and, as we have said in our report, the time has arrived when we must require other importers of foreign oils to hold back to the extent necessary for India's indigenous production to find its market in India itself. We have not merely our own organization there to protect. That is important and we shall certainly protect it. But what is even more important, and especially so in today's gravely depressed economic position of India—a depression which is causing the authorities of everyone concerned with the well being of that continent the deepest anxiety—is that we should do what we can to protect the employment of the many thousands of Indians and Burmese for which the indigenous industry provides, and which is being menaced by these imports under the conditions I have described. That duty we shall not shirk."

STANDARDIZE BENZOL TESTS

NEW YORK, July 3.—Delegates representing benzol producers of Great Britain and the Continent, meeting recently in Hamburg for the fourth plenary meeting of the International Conference of Benzole Producers, voted to standardize methods of test for all grades of benzol in order to establish a uniformity of quality of motor and industrial benzol by the European benzol industry.

Market conditions affecting motor benzol and other competing motor fuels were discussed, and the decision to standardize quality was made to protect European consumers against low grades which have recently made their appearance in European markets in large quantities.

TO START HEARING ON PROPOSED 15% INCREASE IN RAIL RATES

By C. E. Kern
Washington Bureau, The Oil and Gas Journal

WASHINGTON, D. C., July 3.—The representatives of the oil industry should attend the initial hearing before the Interstate Commerce Commission in the matter of increases in rates and charges ex parte No. 103 on July 15, 1931, at 10 a. m.

At this hearing in Washington, D. C., the petitioners and parties supporting the petition will be heard. The chief contentions of the railroads will be announced at that time. There has been doubt in respect to the scope of rate increases that will be sought by the railroads and some uncertainty as to their effort to exact higher rates for the carriage of petroleum and products but seems certain at this time that the oil industry will be called upon to defend itself from increases.

The case of the railroads should be set forth fully at the hearing beginning July 15, after which other hearings will be held for the cross examination of the witnesses at the initial hearings and the defendant shippers or protestants will have ample opportunity to submit evidence. These later hearings will begin August 31 so that ample time will be given to prepare the defense.

In announcing these hearings the commission states:

"It is requested that all who desire to offer evidence in opposition notify the commission on or before July 20, indicating the general character of the evidence and the approximate amount of time required.

"It is desired, however, that evidence be presented as concisely as possible, using exhibits to curtail oral testimony.

"As far as practicable exhibits should be made available to all parties of record in advance of the time at which they are to be offered in evidence.

"Hearings will probably be held at points other than Washington, but the number of such places will be limited.

"Following receipt of the requests for hearing, a schedule will be prepared and announced covering dates, places and the order of testimony."

Administrative charge of the hearings will be under Commissioners Meyer, Lewis and Lee and other members of the commission will attend the hearings to the extent that their other duties will permit.

The commissioners will be assisted by Examiners William A. Disque, G. H. Mattingly and Howard Hosmer.

STANAVO, INC. EXPANDS WORLD-WIDE OPERATION

NEW YORK, July 6.—A division of the petroleum business which has not been affected adversely by current depression in the industry came to light this week with reports of plans for further expansion in world marketing operations by Stanavo Specifications Board, Inc.

Stanavo, formed about two years ago by Standard Oil Co. of New Jersey, Standard of Indiana and Standard of California, has made substantial progress since that time. Refinery research in the production of proper gasolines and lubs for aircraft engines has been correlated, and marketing of the resulting products has been developed to the point where the products are supplied not only along recognized air routes, but in many out-of-the-way places in the world.

Gasoline bases are maintained by Stanavo at such places as Nome and Point Barrow, Alaska; in Greenland; in the sub-Arctic territories of Canada; throughout South America and at many points in China and Japan. Stanavo's aviation gasoline in many parts of northern Canada is left in charge of a mounted policeman, a forestry ranger, or even with Indians and Eskimos, pending some need for the fuel.

Present expansion plans of the organization involve the development of Stanavo depots in India, Africa and Australia, while marketing outlets in England and the Continent have been taken care of through arrangements with various American and European oil companies operating in these territories.

ARKANSAS TAX SITUATION

Service station operators in only four towns in northern Arkansas have been permitted to reduce the state tax from 6 to 2 cents to compete with Missouri stations. Arkansas jobbers along the Missouri line have lost the bulk of their gasoline business due to the fact that the Missouri tax is only 2 cents while Arkansas is 6 cents.

REGULATE BUILDING OF STATIONS ON HIGHWAYS

The method of constructing service stations along the main trunk highways is a problem which has received serious consideration in several states. Due to the heavy traffic it is necessary that the service station approaches not interfere with the use of the highways and at the same time enable the car user to see the stations readily.

The highway department of Minnesota has recently adopted uniform rules which will be tried out to govern the service station construction along the main highways. The rules provide:

"For commercial establishments, such as filling stations, stores, stands, etc., we will furnish culverts, if necessary, and permit the owners to construct one or two entrances, provided no portion of the structure or pumps is placed nearer than twenty-five (25) feet from our right of way. It is not expected that we will supply a culvert for the entire front of an establishment. Ordinarily culverts of 24 feet will suffice.

"Care must be taken in the construction of all entrances that the grade of the entrance is carried out from our shoulder on a slightly falling grade for a distance of at least six (6) feet, preferably 10 feet so that the entrance does not drain onto our highway."

SUES FLORIDA STANDARD

NEW YORK, July 3.—Standard Oil Co. of Kentucky has filed suit in federal court against Standard Oil Co. of Florida asking an injunction to prevent the latter from using the name Standard Oil in its operations.

The complaint of the Kentucky company states that Standard Oil Co. of Kentucky has operated in several southern states, including Florida, for the past 20 years, and that the Standard Oil Co. of Florida is deriving the benefits of the advertising and good will created for the Standard Oil name in Florida by the Kentucky company.

RUMANIA REFINERS BID ON SPANISH BUSINESS

NEW YORK, July 3.—According to reports from Spain, Rumanian refiners, who were frozen out of the Spanish market when the new administration in Spain gave the bulk of the country's business to the Soviet, offered to supply Spain's requirements for the next three years at 15 per cent under world price levels. The Soviet contract is based on a scale of prices 9 to 18 per cent under world levels, the discount varying as to products.

The Soviet contract calls for 875,000 tons of gasoline, or approximately 56 per cent of Spain's requirements; 150,000 tons, or 60 per cent of the Spanish gas oil requirements, and 150,000 tons of fuel oil, amounting to about half of Spain's needs. United States sellers will supply 40,000 tons of gasoline and Societe Espagnole des Petroles (Cespa), operating a refinery at Teneriffe, will supply 70,000 tons of gasoline and 130,000 tons of other refined products.

TANKER SHIPMENTS TO ALBANY BY STANDARD

NEW YORK, July 3.—Standard Oil Co. of New York has initiated direct tanker shipments of gasoline to its Albany, N. Y., terminal, the tanker Levant Arrow, a carrier of 10,000 tons gross with a carrying capacity of approximately 3,150,000 gallons of gasoline, completing delivery of a full cargo at Albany this week.

The shipment taken to Albany by the Levant Arrow is believed to be the largest single gasoline shipment moved up the Hudson River as far as Albany, and several other large companies with extensive terminal facilities at Albany are expected to follow suit. From Albany the gasoline is trans-shipped by barge tanker up the state barge canal, and is moved by tank car and truck into other sections of the company's marketing area.

Completion of an extensive up-state marketing system by Socony, with construction of its new gasoline pipe line inland from Providence, will substantially integrate the company's marketing operations in its "home" territory.

MEET NEW COMPETITION

Several marketing companies in the East are making preparations to meet the competition of what is termed the "shanty oil dealers" who are selling lubricating oils along many of the main highways at 10 to 15 cents per quart. Many of these dealers are buying the oils from various sources in drum and tank car lots. Due to the low prices prevailing at refineries, these dealers are able to show a profit despite the low retail prices charged.

The larger established are now planning to distribute branded lubricating oils of guaranteed specifications. These oils will be sold in sealed and certified bottles.

ENLARGING SARNIA PLANT

NEW YORK, July 3.—Imperial Oil Co., Ltd., Canadian subsidiary of the Standard Oil Co. (New Jersey), has announced plans for a $1,000,000 addition to the company's refinery at Sarnia, Ontario. The new unit will comprise a debuntanization plant.

The plant addition, designed to improve the quality of motor fuel produced by Imperial, is said to be a direct result of the tariff changes made at the special session of Parliament at Ottawa last autumn, extending additional protection to Canadian refined products.

Denial was made by the company of reports that it would enter the gas business.

Socony-Vacuum Meetings On July 30

Merger Plan to Be Submitted to Stockholders for Approval on That Date. Dividend Announcements on Oil Securities

Meetings of stockholders of both Standard Oil Co. of New Jersey and Vacuum Oil Co. have been called for July 30 to vote on the merger of the two companies. Identical notices have been sent to stockholders of both companies. Although it is not officially stated, it is understood that holders of sufficient of the shares of each company have signified their approval to assure consummation of the merger.

The assets of the company will be united under the name of "Socony-Vacuum Corp.," which will have authorized capital of $1,000,000,000, divided into 40,000,000 shares of $25 par value. Of these, 31,915,797 shares will be issued to stockholders of both companies, the balance remaining unissued.

The notice to stockholders states:

"The advantages of union to both companies set forth in our earlier letter not only exists today but altered conditions have made it increasingly important to them that they combine their interests for the protection of their widespread business activities and their further development. With this in mind and after carefully weighing the changes in the situation, the boards of directors of the two companies have agreed that the contract to be submitted to stockholders be modified so as to provide that stockholders of Vacuum Oil Co. will receive two and one-half shares of the capital stock of Socony-Vacuum Corp. for each share of stock of the Vacuum Oil Co. surrendered to the Vacuum Oil Co. for cancellation. The stockholders of the Standard Oil Co. of New York will receive new certificates in the name of Socony-Vacuum Corp. for their present shares."

The original merger plan, made public February 21, 1930, prior to the litigation which resulted in the dismissal of the Government's suit last April (the decision became final June 4 with expiration of the time within which the Government might appeal), contemplated the exchange of share on a three for one basis.

The board of directors of the Socony-Vacuum Corp., the announcement states, will upon consummation of the contract be composed of directors chosen in equal number from the present directorate of the Vacuum Oil Co. and the Standard Oil Co. of New York. To preserve the good will attached to the names of the present companies there will be organized two subsidiary corporations of Socony-Vacuum Corp. to be known, respectively, as "Vacuum Oil Co., Inc." and "Standard Oil Co. of New York, Inc." These subsidiaries will be utilized in carrying on with the same management the businesses now conducted respectively by Vacuum and Socony.

Tide Water Associated

Tide Water Associated Oil Co. directors omitted the semiannual dividend of 30 cents due on the common stock at this time.

Tide Water Oil Co. declared the regular quarterly dividend of $1.25 on the 5 per cent preferred, payable August 15 to stock of record July 16.

Southern Natural Gas

Southern Natural Gas Corp., a subsidiary of Tri-Utilities Corp., reports May gross revenues of $244,335 and balance after ordinary taxes $141,372. For five months ended May 31, 1931, gross revenues amounted to $1,355,386 and balance for interest and other charges $780,538. Interest requirements for the five months' period was $445,912 on the $17,836,500 first mortgage 6 per cent sinking fund gold bonds outstanding at end of May, 1931.

Empire Gas & Fuel

Empire Gas & Fuel Co. has declared the regular monthly dividends of 66⅔ cents on the 8 per cent preferred, 58⅓ cents on the 7 per cent preferred, 54 1/6 cents on the 6½ per cent preferred and 50 cents on the 6 per cent preferred stocks, all payable August 1 to stock of record July 15.

Eureka Pipe Line

Eureka Pipe Line Co. has declared the regular quarterly dividend of $1, payable August 1 to stock of record July 15.

Jersey Employes' Stock

The directors of the Standard Oil Co. of New Jersey have named $34 a share as the price at which its employes may buy stock under the stock purchase plan in the last half of this year. For the first half year the directors set the price at $47.50 a share. For the last half of 1930 it was $69.

Under the third stock-purchase plan, which will expire with this year, the price at which the trustees could obtain the stock from the company for employes was to be fixed on January 1 and July 1 of each year. The price was not to be above nor more than 10 per cent below the average market price of the stock on the New York Stock Exchange for the previous three months, and in no event below the par value of $25. Recently the stock sold at a low mark of 30⅝, which accounts for the low offering price to employes. The stock is now around 39.

At the close of last year subscribers to the third stock-purchase plan numbered 26,252, compared with 18,919 at a similar point of the second plan and 12,171 in the first. As a result of the buying, Walter C. Teagle, president, estimated recently that more than 4 per cent of the company's outstanding stock is owned by employes. In the 11 years that the plans have been in effect, he said, employes have invested more than $39,100,000 out of their wages in this manner.

A fourth stock-acquisition plan, substantially the same as the second and third, with several important exceptions, was authorized at the annual stockholders' meeting recently. It was modified to permit the directors to determine whether it should go into effect on January 1, 1932, or be postponed to a later date. Business conditions generally and the prolonged depression in the petroleum industry in particular were responsible for the new clause.

Twenty Representative Stocks

The Oil and Gas Journal's weekly average price of 20 representative petroleum stocks listed on the New York Stock Exchange and New York Curb, based on closing quotations for Wednesday, was as follows:

Nov. 12	30.18	Mar. 11	26.53
Nov. 19	31.54	Mar. 18	26.78
Nov. 26	30.86	Mar. 25	26.35
Dec. 3	30.53	Apr. 1	24.80
Dec. 10	28.57	Apr. 8	25.52
Dec. 17	25.42	Apr. 15	24.72
Dec. 24	25.68	Apr. 22	22.73
Dec. 31	26.15	Apr. 29	20.54
Jan. 7	27.56	May 6	20.74
Jan. 14	27.31	May 13	20.28
Jan. 21	27.55	May 20	19.25
Jan. 28	27.26	May 27	18.35
Feb. 4	27.26	June 3	18.00
Feb. 11	28.76	June 10	19.62
Feb. 18	28.53	June 17	19.23
Feb. 25	29.33	June 24	22.33
Mar. 4	27.67	July 1	22.32

Stock Values Up

The market value of all shares listed on the New York Stock Exchange increased $4,383,161,902 in June to a total of $47,417,147,581 as of July 1.

The average market value of all listed shares as of July 1 was $36.38, compared with $32.58 as of June 1. There were 1,297 stock issues, aggregating 1,303,489,082 shares, listed as of July 1, compared with 1,297 issues, aggregating 1,305,516,716 shares on June 1.

Total borrowing by stock exchange members against collateral on July 1 amounted to 2.93 per cent of the market value of all shares listed on the exchange on that date, a decrease of .44 per cent during the month and a new low record. Borrowings during June decreased $43,358,728 to $1,391,324,922 at the end of June.

STATE ROYALTY ON SEEPAGE

AUSTIN, Tex., July 4.—Judge J. D. Moore, of the District Court of Travis County, held that the State is entitled to royalty on oil which seeped out of the ground and came out on the surface of a lease without drilling.

The suit involved the State's claim to royalty on oil obtained by the Grayburg Oil Co., from a 280-acre lease to the Pecos River bed adjacent to the Yates oil field in Pecos and Crockett Counties. The oil company held the lease under the State, but contended that it owed no royalties on the 261,420 bbls. of oil in controversy because the oil seeped out of the ground and came out on the surface of the lease without being drilled for by the oil company. The oil had never appeared on the surface of the ground before appearing on the river bed lease, it was held.

The State contended that it was oil produced within the meaning of the lease and that the company owed royalty. Attorneys, geologists and oil men said the case was unique and probably the first of this kind.

ISSUE PRATT PATENT

Announcement was made the past week that the United States Government Patent Office had issued a patent (No. 1,810,574) covering the main features of what is commonly known as the Pratt cracking process. The patent was issued to Clinton John Pratt and has been assigned to Automotive Distillate Corp. of Independence, Kans. The latter corporation has charge of the licensing of the process. A large unit of the process was recently placed in operation at the East St. Louis, Ill., refinery of the Lubrite Refining Co. The installation was made by the J. P. Devine Manufacturing Co.

STANDARD OIL STOCKS ON NEW YORK CURB

Quotations Compiled by Francis, Bro. & Co., Associate Members of New York Curb, Kennedy Building, Tulsa, Okla.

(Complete record week ending June 27)

1931 High	1931 Low	Week ended June 27 Sales	Week ended June 27 High	Week ended June 27 Low	Close July 1	Stocks	Outstanding capital	Par value	Div. rate	Last paid	1928 High	1928 Low	1929 High	1929 Low	1930 High	1930 Low
1	⅛	No sales.	..	..	..	Atlantic Lobos	499,448	N.P.	....	5-28-30	..	..	..	..	1	¼
12⅞	6¼	100	8½	8	..	Borne Scrymser	$1,000,000	$25	....	10-15-30	56½	44½	46½	25	25	11¼
51	40	No sales.	..	..	..	Buckeye Pipe Line	$10,000,000	$50	$1Q	6-15-31	76	53	74½	55	69	39⅞
129½	101	200	122	117¾	..	Chesebrough Mfg.	$3,000,000	$25	$1Q‡	6-30-31	161	117	210	130	184⅞	104¼
30	20⅝	50	22¼	22¼	..	Cumberland Pipe Line	$1,500,000	$50	50eQ	6-15-31	114	67	75¾	40	65¾	20¼
31	24	100	30	30	..	Eureka Pipe Line	$5,000,000	$100	$1Q	5- 1-31	88	64½	70½	42	54¾	26
2⅞	1	No sales.	..	..	..	Galena Signal Oil	$16,000,000	$100	....	.....	13	4¼	6½	3	7	2½
72	49⅞	3,600	67⅝	56	66	Humble Oil & Refining	$74,103,300	$25	50eQ	7- 1-31	114¾	59½	128	74⅛	119	57¼
18¼	9⅞	10,900	14	12¼	12⅞	Imperial Oil of Canada (new)	25,421,768	N.P.	12½cQ	6- 1-31	104	56¾	41	22	30	15
21¼	9½	400	11½	10	..	Indiana Pipe Line (new)	$3,000,000	$10	25cQ	5-16-31	91⅞	74¾	41⅞	26	41	14½
15½	8¾	19,200	12¼	10½	12	International Petroleum (new)	14,247,088	N.P.	25cQ	6-15-31	55	35	30⅝	15	24	11⅝
17½	11¼	500	13⅜	13⅝	..	National Transit	$6,362,500	$12.50	25cQ	6-15-31	32⅜	19⅜	25⅛	10⅛	22⅝	11½
14½	7⅞	100	9	9	..	New York Transit	$1,000,000	$10	25cQ	7-15-31	75	38½	17½	10	21⅝	10¼
30	27	50	27	27	..	Northern Pipe Line	$2,000,000	$50	$2SA	7- 1-31	69	56½	63	41	54	26¼
15½	8	No sales.	..	..	..	Penn Mex Fuel	$10,000,000	$25	75c	6-24-31	84	28	44½	20	32	12
8	3¼	200	4½	4½	6	Solar Refining	$4,000,000	$25	....	12-20-29	..	..	50	29	33	4⅞
17	10	No sales.	..	..	11	Southern Pipe Line	$1,000,000	$10	50c	6- 1-31	19	15	22½	13	20⅞	8⅜
23⅞	12⅜	2,900	16	13½	15	South Penn Oil	$30,000,000	$25	25eQ	6-30-31	71⅞	36¾	60¼	35⅛	45⅞	16⅛
38	31¼	No sales.	..	..	31⅛	Southwest Pennsylvania Pipe Line	$1,750,000	$50	$1Q	7- 1-31	102	70	70	60	64	32
38½	19⅛	71,300	28½	25½	26¾	Standard Oil of Indiana	$348,175,069	$25	50eQ	6-15-31	95⅞	70⅞	63	45	59⅞	30
23⅝	15⅝	5,900	19⅞	18	18⅝	Standard Oil of Kentucky	$25,654,516	$10	40eQ	6-30-31	179¾	122¼	46⅞	29	40½	18⅝
36½	19¼	200	27	24⅜	..	Standard Oil of Nebraska	$4,649,225	$25	50eQ	6-20-31	54⅞	39⅞	50¼	40	48⅞	34⅜
62½	35	1,550	45	40	..	Standard Oil of Ohio	$14,000,000	$25	62½eQ	7- 1-31	134	71	129	60	108½	43¼
3½	2¾	No sales.	..	..	..	Swan-Finch Co.	$861,466	$25	....	1-15-29	23¼	16	18	10	10	4
69¾	22⅛	38,600	44⅞	38	42¾	Vacuum Oil Co.	$126,180,350	$25	50cQ	6-20-31	111	72	133¾	75	97¾	45⅝

*Ex-dividend. †Unit of trading less than 100 shares. ‡Plus 50 cents extra.

INDEPENDENT OILS ON NEW YORK CURB

Quotations Compiled by Francis, Bro. & Co., Associate Members of New York Curb, Kennedy Building, Tulsa, Okla.

(Complete record week ending June 27)

1931 High	1931 Low	Week ended June 27 Sales	Week ended June 27 High	Week ended June 27 Low	Close July 1	Stocks		Outstanding capital	Par value	Div. rate	Last paid	1928 High	1928 Low	1929 High	1929 Low	1930 High	1930 Low
1¾	½	12,200	1	⅝	..	American Maracaibo	(sh)	700,000	N.P.	....	.....	9½	3⅛	8⅝	1⅛	4½	½
16⅞	8½	900	11¾	10¼	..	British American Oil Corp.		1,311,321	N.P.	20cQ	7- 2-31	55	32¾	62	7⅞	23	13⅜
2⅜	½	11,600	1¾	1⅛	1½	Carib Syndicate		$131,250	25c	....	.....	4½	3⅞	4⅞	1	2¾	⅝
20¾	9¾	167,700	13½	11⅝	12⅝	Cities Service	(sh)	24,290,359	N.P.	30cA‡	7- 1-31	90⅞	54	68⅛	20	44¼	13
84¾	61¼	1,100	67⅛	63½	67⅝	Cities Service pfd.	(sh)	1,500,000	N.P.	50cM	7- 1-31	103¼	94½	98¾	84	93⅞	78¼
½	⅛	2,600	⅛	⅛	..	Colombia Syndicate		$2,000,000	$1	....	.....	3¼	.76	2	½	¾	⅛
2¾	1½	200	1½	1½	1½	Consolidated Royal		$5,527,875	$10	7½cQ	4-25-31	8⅞	6¼	11⅛	2½	5⅞	2
⅝	¼	200	¼	¼	..	Crown Central		.....	....	....	.....	..	..	..	..	..	..
5	2	100	2¾	2¾	..	Darby Petroleum		1,019,392	N.P.	....	10-15-30	33½	3¼	26	6½	21¾	4¼
6	2½	800	3½	3⅛	3¼	Derby Oil & Refining	(sh)	500,000	N.P.	....	.....	2¼	1	11	2	11	2
40⅛	26	100	33	33	..	Derby Oil & Refining pfd.		48,500	N.P.	....	.....	21⅜	7½	44	20⅜	60	30
75½	38	12,600	61⅞	51	62	Gulf Oil Corp.	(sh)	4,504,921	$25	37½cQ	7- 1-31	165	101⅛	209	115	166⅞	58½
⅝	¼	9,400	⅜	¼	⅜	Intercontinental Petroleum		$5,682,000	$5	....	.....	3⅝	1	2⅞	⅜	1¾	⅝
1⅞	½	200	¾	¾	..	Kirby Petroleum	(sh)	750,000	N.P.	....	.....	3	1¼	3⅝	1¼	3	⅞
1½	½	3,100	1	⅝	⅝	Leonard Oil & Development		$50,000,000	$25	....	.....	9⅜	5⅛	6⅛	1	4¾	½
6¾	3½	200	4	4	..	Lion Oil & Refining	(sh)	250,000	N.P.	....	10-27-30	43⅞	20	38⅞	18	29	4⅞
25	14⅛	9,400	18⅞	16½	18	Lone Star Gas	(sh)	5,000,000	N.P.	22cQ	6-30-31	69⅛	48½	67⅞	28	55⅞	19⅝
½	⅛	2,500	⅛	⅛	⅛	Magdalena Syndicate	(sh)	850,000	$1	....	.....	1⅞	½	1¼	½	½	⅛
5	3	100	4	4	..	Margay Oil Corp.		160,000	N.P.	....	7-10-30	48½	32	38½	14	16	3
4⅞	1½	No sales.	..	..	..	Mexico-Ohio Oil Co.		500,000	N.P.	....	.....	8	2¾	6⅜	2¼	7½	1¾
½	¼	No sales.	..	..	..	Mountain & Gulf		$4,000,000	$1	....	4-15-31	1¾	.76	1½	¼	¾	⅜
5⅞	3⅛	900	4	3½	4	Mountain Producers		$1,682,182	$10	25cQ	7- 1-31	28⅞	19½	22⅞	7	12⅛	3¾
1½	½	2,800	¾	½	..	New Bradford Oil		$1,095,291	$5	....	4-15-31	5⅝	4¼	5	2½	3½	1⅛
3	1¼	2,200	1⅝	1¼	1½	New Mexico and Arizona		$1,000,000	$1	....	.....	11⅞	7⅛	9⅜	2¼	7¼	1½
3¼	1⅛	100	2	2	..	North Central Texas	(sh)	400,000	N.P.	....	9- 2-30	14¼	8½	18½	6⅛	11¼	2⅛
½	⅛	12,300	¼	⅛	⅛	Pandem	(sh)	489,875	N.P.	....	.....	6	2⅛	3½	½	2½	¼
2	⅜	500	1	⅝	⅞	Pantapec Oil	(sh)	1,506,000	N.P.	....	.....	15⅝	8½	10½	1⅞	4⅜	⅞
2½	1¾	600	2¼	2¼	..	Red Bank Oil	(sh)	250,000	N.P.	....	.....	18	4⅞	16	9⅝	10⅜	1½
1½	½	1,000	1⅛	1	1⅛	Reiter-Foster	(sh)	388,584	N.P.	....	12- 2-29	12⅞	4⅛	8½	1⅛	5⅜	1
3	1¼	200	1⅞	1⅞	2	Ryan Consolidated	(sh)	500,000	N.P.	....	.....	12	4⅛	11	2	8⅝	2
1⅜	¾	500	1	¾	..	Salt Creek Consolidated	(sh)	1,286,300	$10	....	4- 1-31	7¼	5½	5⅞	1⅞	2½	½
7¾	4	2,100	5¼	4⅝	5	Salt Creek Producers	(sh)	1,496,859	$10	35cQ	5- 1-31	35	23⅛	25⅞	9	15¼	5¼
5¼	1	12,700	2½	1⅜	2	Sunray Oil Corp.	(sh)	1,163,185	$5	5%Q§	4-15-31	..	..	12	5⅝	10	2
1⅞	⅝	7,200	⅞	¾	..	Venezuelan Petroleum	(sh)	755,090	$5	....	2-15-30	9⅛	4¾	6½	1¾	4½	⅜
3½	1½	No sales.	..	..	..	Woodley Petroleum		$500,000	$1	....	3-31-29	8¼	4⅞	9½	2	5	½
1½	¼	200	⅜	⅜	1½	Y Oil & Gas		100,000	N.P.	....	.....	8⅜	2⅛	2⅞	½	2½	⅜

*Ex-dividend. †Unit of trading less than 100 shares. ‡Payable monthly and monthly stock dividend of one-half per cent. §Paid in lieu of regular cash dividend of 2 per cent.

TRANSACTIONS IN OIL SHARES ON NEW YORK STOCK EXCHANGE

Quotations Compiled by Francis, Bro. & Co., Members of the New York Stock Exchange and Associate Members of New York Curb, Kennedy Building, Tulsa, Okla.

(Complete record week ending June 27)

1931 High	1931 Low	Week ended June 27 Sales	Week ended June 27 High	Week ended June 27 Low	Close July 1	Stocks		Outstanding capital	Par value	Div. rate	Last paid	1928 High	1928 Low	1929 High	1929 Low	1930 High	1930 Low
23	15½	2,500	17½	16	17⅞	Amerada Corp.	(sh)	922,075	N.P.	50cQ	4-30-31	43⅞	27⅛	42⅞	17½	31½	16½
12⅜	5	2,100	8	6½	6½	American Republics Corp.	(sh)	209,180	N.P.	....	12-31-31	85	51⅛	64⅜	12½	37	5⅛
31	20	No sales.	..	..	..	Associated Oil		$57,260,300	$25	35c	6-30-31	53¾	37½	47¼	34½	51	30
23⅝	11⅛	31,100	17⅞	14¾	16	Atlantic Refining		$66,763,775	$25	25cQ	6-15-31	66⅜	50	77⅛	30	51⅝	16⅝
14½	5¾	37,100	9¾	7⅜	8¾	Barnsdall Corp. A		$56,546,600	$25	25cQ	5-11-31	54	20	49⅞	20	34	8⅝
12	5	74,100	9½	7¾	8⅝	Continental Oil of Delaware	(sh)	4,741,554	N.P.	....	12-15-27	..	..	47⅞	18	30½	7¾
47	15¼	47,500	26⅞	20¾	24¾	General Asphalt	(sh)	413,333	N.P.	75cQ	6-15-31	94⅞	68	94⅜	42¼	71½	22⅜
68½	27	31,300	46½	37½	45½	Houston Oil		$24,968,600	$100	....	10-17-30	167	79	109	26	116⅞	29¼
14⅛	6	30,100	10⅜	8	10	Houston Oil (new)	(sh)	998,744	$25	....	.....	..	..	..	..	11¾	6⅝
4⅝	2	1,900	3	2⅛	2½	Indian Refining		$12,564,070	$10	....	10- 1-30	39⅝	9	53	13⅛	17	2
4½	2	300	3¼	3⅛	3⅛	Louisiana Oil Refining	(sh)	1,190,063	N.P.	....	.....	19¾	9⅜	18	7	12	3½
3⅜	1	2,500	3	1½	2	Maracaibo Oil	(sh)	330,000	N.P.	....	.....	25½	12½	18½	5½	10⅜	1⅜
20¾	10⅝	84,300	16¾	14½	16	Mexican Seaboard	(sh)	1,244,383	N.P.	....	10- 1-24	72	4⅝	50⅜	8¼	37	9¾
16⅜	5¾	24,400	10⅛	8½	9½	Mid-Continent Petroleum	(sh)	1,857,912	N.P.	....	2-16-31	44½	25⅛	39⅞	22⅛	32	11
19½	7	50,200	11⅝	9	11	Ohio Oil	(sh)	6,648,052	N.P.	....	3-14-31	84	58½	79⅞	64¼	32	16
35⅛	25	No sales.	..	..	..	Pan American P. & T.		$50,084,700	$50	40c	7-20-31	50⅞	38¼	69	40½	46½	42
36½	24	100	28½	28½	..	Pan American P. & T. "B"		$121,110,650	$50	40c	7-20-31	59⅞	37¾	69¼	40½	67¼	30
4¼	1½	2,900	2⅝	2	..	Panhandle P. & R.	(sh)	199,370	N.P.	....	.....	21¾	11½	15¼	3	12¾	1¾
20	10	No sales.	..	..	..	Panhandle P. & R. pfd.		$2,564,400	$100	....	.....	108	70	76	47½	20	47½
16⅝	4¾	53,500	9⅜	6⅞	8¾	Phillips Petroleum	(sh)	2,593,075	N.P.	....	1- 2-31	53⅞	35¼	47	24¼	44⅜	11½
1½	½	2,000	¾	⅝	..	Pierce Oil Corp.		$29,622,831	$25	....	.....	5¼	½	3⅜	1	2½	½
3⅜	1	11,600	2⅛	1½	2	Pierce Petroleum	(sh)	2,500,000	N.P.	....	2-16-31	7	3½	5⅞	½	7⅛	1⅛
20⅜	6½	6,700	10⅞	9⅝	10⅛	Prairie Oil & Gas		$60,848,000	$25	....	3-31-31	68	46	65⅜	40½	54	11¼
26½	14⅝	12,500	20⅝	18⅜	18¾	Prairie Pipe Line		$101,250,000	$25	75cQ	6-30-31	280	172	65	45	60	16⅝
6	1⅞	600	3	2⅝	..	Producers & Refiners		$37,438,950	$50	....	9-15-23	29⅞	16	25⅞	4	11⅞	1
16	6½	170	9	8	..	Producers & Refiners pfd.		$2,845,350	$50	....	5- 4-25	49⅝	41	46⅜	25½	40	11½
11⅞	5½	18,500	8⅞	6½	8	Pure Oil		$75,959,250	$25	....	9- 1-30	31⅝	19	30¾	20	27¼	7⅝
6⅜	1	5,400	2	1⅜	1¾	Richfield Oil (new)		$52,410,875	N.P.	....	.....	56	23	49⅝	20	9¾	4⅛
10¼	3⅛	12,900	5⅛	4⅜	4⅜	Rio Grande Oil	(sh)	1,236,270	N.P.	....	7-25-30	37½	32	42½	15	25⅜	5
42⅝	24⅞	19,400	33¼	28½	33	Royal Dutch, N. Y.	(sh)	611,303	....	$1.3404	1-30-31	64	44⅝	64	43⅛	56½	36⅞
34	19	90	26	25⅛	..	Shell Transport & Trading Co.		£23,985,000	£1	$0.966	7- 6-31	47⅞	41⅝	51½	40⅝	48⅝	26
10¼	4½	50,300	8	6⅛	7¾	Shell Union Oil	(sh)	13,066,497	N.P.	....	6-30-30	39¼	23¼	31⅜	19	25½	5¼
11	5	2,900	10	5	..	Simms Petroleum		$8,353,620	$10	....	9-15-30	27½	18⅛	40⅛	15	37	5⅝
15⅞	6¼	120,100	11	8½	10⅝	Sinclair Consolidated	(sh)	5,500,000	N.P.	25cQ	4-15-31	46¾	17⅜	45	21	32	9¾
103	77	100	87	87	..	Sinclair Consolidated pfd.		$16,025,250	$100	$2Q	5-16-31	110	102½	111	103	112¼	86
12⅞	3⅛	2,400	6	4¼	..	Skelly Oil		$27,441,250	$25	....	12-15-30	42⅝	25	40½	28	12	10⅛
51⅜	31⅛	85,100	39¾	36	37¾	Standard of California	(sh)	12,594,098	N.P.	62½cQ	6-15-31	80	63	81⅞	51½	75	42½
19	8¾	4,500	14	12	..	Standard of Kansas		$8,000,000	$25	....	3-16-31	37¾	15	33¾	18	49	14⅜
52½	30⅝	188,600	41¾	37⅛	39	Standard Oil of New Jersey		$634,999,200	$25	25cQ†	6-15-31	59⅝	37¾	83	49	84⅞	32½
26	13⅞	179,400	18¾	16	17¾	Standard Oil of New York		$445,223,675	$25	40cQ	6-15-31	33¼	28¾	48⅛	31¾	40⅝	19⅝
45⅛	31	600	36¾	33½	..	Sun Oil	(sh)	1,416,869	N.P.	25cQ	6-15-31	77	31½	68⅜	55	70	39
1¾	¾	900	1	¾	⅞	Superior Oil Corp.	(sh)	776,979	N.P.	....	12-20-30	..	..	24	5¼	9⅜	¾
36¼	18	71,800	24⅞	20¼	24	The Texas Corporation		$246,204,900	$25	50cQ	7- 1-31	74¾	50	71⅞	50	60½	28¼
6½	2½	1,700	4⅜	3½	..	Texas Pacific Coal & Oil Co.		$9,304,890	$10	....	12-31-29	26⅝	12⅛	23⅞	9½	14½	4
9	4¼	No sales.	..	..	..	Tide Water Oil	(sh)	2,191,759	N.P.	15cQ	6-30-31	41½	19⅝	40	14	31	13
83	54	100	59	59	..	Tide Water Oil pfd.	(sh)	19,947,000	N.P.	$1.25Q	5-16-31	100⅛	86	97½	85⅛	94⅞	71
9	4	22,000	6¾	5⅞	6	Tide Water Associated	(sh)	5,560,424	N.P.	30c8A	2-16-31	25	14¾	23½	10	17¾	5⅞
68	38	2,200	44	39⅞	46¾	Tide Water Associated pfd.		$73,284,500	....	$1.50Q	7- 1-31	..	..	90⅞	74⅛	89¾	55
26⅝	14	28,800	19⅞	18¾	18⅜	Union Oil of California		$104,342,375	$25	50cQ	5- 9-31	58	42⅜	57	42⅛	50	10⅛
25⅛	20	1,300	23	20½	21½	Union Tank Car	(sh)	1,254,048	$100	40cQ	6- 1-31	128¼	110	163¾	121⅞	38½	23
7⅜	1⅝	2,100	3¾	2¾	..	Warner-Quinlan	(sh)	632,948	N.P.	....	7- 1-30	44⅞	26	42⅞	15	27	4¼
9⅜	3½	1,100	6	5	..	Wilcox Oil & Gas	(sh)	428,907	N.P.	....	5-10-28	..	..	29¾	12⅛	21	6½

*Ex-dividend. †Unit of trading less than 100 shares. ‡Plus extra dividend of 25 cents.

In comparing highs and lows for the several years in the three tables, it will be necessary to take into consideration cases where there have been stock split-ups.

EAST CENTRAL TEXAS

(Continued from Page 25)

Joiner Pool, or a third of the present producers now requiring pumping or agitation to produce oil, proving the loss of pressure in this field, and a necessary added expense of production.

Of the nine wells producing on the Sinclair Oil & Gas Co.'s Holland lease in the Joiner Pool, seven have quit flowing and the other two are producing around 2,450 bbls. per day.

Ten or twelve-cent oil will be a long time in paying for the added cost of pumping equipment which is being installed in this field.

Trades and Sales

Companies are continuing to make trades and sales in the district this week, it being reported that the Shell Petroleum Corp. traded a 100-acre lease of the Fair land in the Pru Survey, Joiner Pool, Rusk County, to Golding & Murchison, the Shell corporation retaining five-sixteenths overriding royalty. Consideration was not given.

The Arkansas Fuel Oil Co. also sold a 108-acre tract in the E. A. Pinkston farm, in the Cadena Survey, Joiner Pool, Rusk County, to Golding and Murchison for $2,500 per acre to be paid out of the oil produced on the acreage. The same company also sold a 26-acre tract on the Arnold farm in the H. B. Goodman Survey, Rusk County, to T. C. Adams, no consideration being given.

Getting Out from Under

From the sales made in this pool, the majority by larger companies holding the acreage, it is apparent that they have been figuring that more profits can be made by selling this acreage and letting the other fellow stand the cost of drilling and producing it, than if they try to produce it themselves. Getting out from under the acreage in this pool seems to be uppermost in the minds of many of the operators who hold leases.

Promoters with their high powered stock-sales talk to lure the ill-advised investor are considered as the only ones who will come out of this area making a great amount of profit, and whether or not a test is an oil well makes little difference to them as they make their money by selling flowery words instead of oil which the legitimate operator has to depend on for his sustenance. East Texas is the promoters' paradise, and those who are living many miles from this pool of all pools in the United States, and who think they can put their money in shares, interests and units and make hundreds of thousands of dollars as described to them, had better save the ink they use to write their checks, and they will save all.

Postal authorities are continually making investigations, but cannot hope to keep up with all the machinations of the promoters who take all but return little if any profits, and it will be many months before any suits are filed against such men, and then it will be too late to rescue the investors who have sunk their savings.

Cranfill & Reynolds are reported to have sold their remaining 60 per cent interest in the acreage they held in the northern part of Gregg County.

Pipe Line Completed

The Sun Oil Co. and Yount Lee Oil Co. have completed their main line and gathering system in Gregg and Rusk Counties extending south to their Troup tank farm, and are now running oil to storage on this farm. It will be around 45 days before the remainder of the line to Beaumont will be completed and ready to transport oil to the coast.

Officers of the newly formed Shamrock Pipe Line Co. which has been formed, principally for the purpose of laying a trunk line out of Rusk and Gregg County to the coast, are Tom Cranfill, Clint Murchison, Pete Burton and Capt. J. F. Lucey. The first two and last named are all of Dallas. Definite information as to the probability of laying this line has not been disseminated as yet, and organization of the company, and construction of the line has been hanging fire for some time.

Dry Hole in Van

The Pure Oil Co. completed another dry hole in the Van Pool, Van Zandt County, this week. This test is located on the J. C. Stewart farm in the A. McPhail Survey, about one-quarter mile southwest of production. Total depth of the test is 2,996 feet. This limits the pool in this direction.

Last week this report stated that another plan for prorating production of the Van Pool was being tried out in the field. Representatives of the Pure Oil Co. had been in conference with officials of other producing companies of the field as to changing the present method of proration, however, not with the idea of increasing such production, but to change the method on which present production is based. Plans for the change are still in the tentative stage, and have not been adopted.

COMPLETIONS IN EAST CENTRAL TEXAS

Gregg County

Vacuum Oil Co.'s No. 1 H. B. Zeigler, oil sand 3,448-88 feet, initial production 64.8 bbls. in 30 minutes on eleven-sixteenths-inch tubing choke, total depth 3,-448 ft. Yount Lee Oil Co.'s No. 3-B J. C. McKinley and others, oil sand 3,-634-54 feet, initial production 93 bbls. per hour through eleven-sixteenths-inch tubing choke, total depth 3,654 feet. Same company's No. 1 E. L. and Annie E. Lee, oil sand 3,596-3,618 feet, initial production 92 bbls. per hour through eleven-sixteenths-inch tubing choke, total depth 3,618 feet. Same company's No. 2 Isaac Denson, oil sand 3,622-40 feet, initial production 104 bbls. per hour through eleven-sixteenths-inch tubing choke, total depth 3,654 feet.

W. F. Turner and others' No. 2 Alonzo Jones, oil sand 3,612-70 feet, initial production 160 bbls. per hour through eleven-sixteenths-inch choke, total depth 3,670 feet. Superior Oil Co.'s No. 1 Andrew Jones, oil sand 3,575-3,655 feet, initial production 97 bbls. per hour through eleven-sixteenths-inch choke, total depth 3,655 feet. Stanolind Oil & Gas Co.'s No. 1 J. E. Willhite, oil sand 3,614-75 feet, initial production 125 bbls. per hour through three-quarters-inch choke, total depth 3,675 feet. O. J. Perrin's No. 1 W. A. Bouknight, oil sand 3,578-3,645 feet, initial production 147 bbls. per hour through eleven-sixteenths-inch tubing choke, total depth 3,645 feet.

Seigler and McCall's No. 1 Missie Young, oil sand 3,541-64 feet and 3,589-97 feet, initial production 105 bbls. per hour through three-quarters-inch tubing choke, total depth 3,597 feet. Mid-Kansas Oil & Gas Co.'s No. 3 E. M. Nettleton, oil sand 3,468-79 feet, initial production 158 bbls. per hour on 2½-inch tubing open, total depth 3,491 feet. Magnolia Petroleum Co.'s No. 1 R. L. Saulter, oil sand 3,573-75 and 3,583-3,602 feet, initial production 935 bbls. per hour open flow, total depth 3,602 feet. Same company's No. 2 C. E. Davis, oil sand 3,514-35 feet, initial production 600 bbls. per hour on open casing and 1-inch tubing choke, total depth 3,535 feet.

Hurlbut and others' No. 1 L. L. Mackey, top Pecan Gap 2,376 feet, base 2,936 feet, top Austin chalk 3,583 feet, top Georgetown lime 3,648 feet, dry and abandoned, total depth 3,651 feet. Humble Oil & Refining Co.'s No. 3 D. C. Johnston, oil sand 3,615-26 feet, initial production 140 bbls. per hour through three-quarters-inch tubing choke, total depth 3,626 feet. Howard Petroleum Co.'s No. 2 Thrasher and Stuckey, oil sand 3,574-3,608 feet, initial production 160 bbls. in 11 minutes through open tubing and one 4-inch line on casing, total depth 3,608 feet. Houston Oil Co.'s No. 1 E. W. Clements, oil sand 3,531-88 feet, initial production 305 bbls. per hour through 2½-inch open tubing, total depth 3,588 feet.

Grady Vaughn and others' No. 1 R. R. Collins, oil sand 3,649-65 feet, initial production 700 bbls. per hour open flow, total depth 3,665 feet. Grisham and Hunter, Inc.'s No. 1 T.&P.R.R., oil sand 3,609-10 feet, initial production 154 bbls. per hour on three-quarters-inch tubing choke, total depth 3,610 feet. Cranfill & Reynolds' No. 1 Martin Hays, oil sand 3,498-3,545 feet, initial production 190 bbls. per hour through 2½-inch tubing, total depth 3,545 feet. Arkansas Fuel Oil Co.'s No. 1-A D. B. McPherson, oil sand 3,555-80 feet, initial production 222 bbls. in 15 minutes on open flow, total depth 3,580 feet.

Shell Petroleum Corp.'s No. 6 J. B. Watson, top sand 3,580 feet, initial production 115 bbls. per hour through three-eighths-inch tubing choke, total depth 3,-629 feet. Same corporation's No. 2 M. H. Bivens, top sand 3,557 feet, initial production 112 bbls. per hour through three-quarters-inch choke, total depth 3,-591 feet. Pilot Oil Co.'s No. 1 W. Smith, top sand 3,531 feet, initial production 112 bbls. per hour through three-quarters-inch tubing choke, total depth 3,561 feet.

Magnolia Petroleum Co.'s No. 1 J. M. Blackman, top sand 3,609 feet, initial production 189 bbls. in 15 minutes through three-quarters-inch tubing choke and open casing, total depth 3,615 feet. Hawkeye Petroleum Co.'s No. 1 Smith, top sand 3,562 feet, initial production 130 bbls. per hour through three-quarters-inch tubing choke, total depth 3,-580 feet. Gulf Production Co.'s No. 5 Birdsong, top sand 3,551 feet, initial production 62 bbls. per hour through three-quarters-inch tubing choke, total depth 3,574 feet.

Edson Petroleum Co.'s No. 1 E. Hegler, top sand 3,651 feet, initial production 257 bbls. per hour through open tubing, total depth 3,676 feet. Sabine Oil & Development Co.'s No. 1 Harris, dry and abandoned, total depth 3,666 feet, top lime 3,569 feet. Shell Petroleum Corp.'s No. 3 J. B. Watson, top sand 3,572 feet, initial production 112 bbls. per hour through three-quarter inch tubing choke, total depth 3,621 feet. B. E. Jones' No. 1 Beall, abandoned location.

Gulf Production Co.'s No. 3 L. D. Crim, top sand 3,623 feet, initial production 105 bbls. per hour through three-quarter inch tubing choke, total depth 3,633 feet. Same company's No. 2 Mary Charles, abandoned location. Elliott and others' No. 4 Andrews, top sand 3,608 feet, initial production 140 bbls. per hour through 1-inch casing choke, total depth 3,616 feet.

Prairie Oil & Gas Co.'s No. 2 J. Elder, top sand 3,505 feet, initial production 126 bbls. per hour through three-quarter inch tubing choke, total depth 3,528 feet. Empire Gas & Fuel Oil Co.'s No. 1 Otto Lockhart, top sand 3,521 feet, base 3,579 feet, initial production 128 bbls. per hour through three-quarter inch tubing choke, total depth 3,580 feet. Sinclair Oil & Gas Co.'s No. 5 Cole, top sand 3,584½ feet, initial production 200 bbls. per hour through open tubing, total depth 3,586 feet.

Magnolia Petroleum Co.'s No. 1 M. T. Cole, initial production 196 bbls. in 15 minutes through 1-inch tubing and open casing, total depth 3,586 feet. The Texas Company's No. 1 H. T. Elder, top sand 3,616 feet, initial production 95 bbls. per hour through three-quarter inch tubing choke, total depth 3,642 feet. Houston Oil Co. and Heep Oil Co.'s No. 1-B Hughey, top sand 3,457 feet, base 3,483 feet, initial production 452 bbls. per hour through 1-inch casing and 1-inch tubing choke, total depth 3,495 feet.

Rusk County

Shell Petroleum Corp.'s No. 2 Willis, abandoned location. Same corporation's No. 6 Rosa Russell, top sand 3,594 feet, initial production 91 bbls. per hour through three-quarter inch tubing choke, total depth 3,647 feet. Same corporation's No. 5 Rosa Russell, top sand 3,705 feet, initial production 97 bbls. per hour through three-quarter inch tubing choke, total depth 3,774 feet.

Humble Oil & Refining Co.'s No. 26 Crim, top sand 3,586 feet, initial production 111 bbls. per hour through three-quarter inch tubing choke, total depth 3,591 feet. Tidal Oil Co.'s No. 3 Terrell, top sand 3,648 feet, initial production 100 bbls. per hour through three-quarter inch tubing choke, total depth 3,652 feet. Stroube and Stroube's No. 2 Lilly and H. Morse, top sand 3,587 feet, initial production 100 bbls. per hour through three-quarter inch tubing choke, total depth 3,639 feet.

Stanolind Oil & Gas Co.'s No. 4 M. R. Terrell, top sand 3,641 feet, initial production 99 bbls. per hour through three-quarter inch tubing choke, total depth 3,647 feet. Humble Oil & Refining Co.'s No. 8-A S. S. Laird, top sand 3,690 feet, initial production 74 bbls. per hour through three-quarter inch tubing choke, total depth 3,707 feet. Abercrombie and Harrison's No. 1 Brightwell heirs, top sand 3,671 feet, initial production 1,600 bbls. in 12 hours through 1-inch choke on casing.

Humble Oil & Refining Co.'s No. 1 Dequerrin, top sand 3,690 feet, initial production 124 bbls. per hour through three-quarter inch tubing choke, total depth 3,735 feet. Magnolia Petroleum Co.'s No. 3 Moore, top sand 3,658 feet, initial production 132 bbls. in 15 minutes through three-quarter inch tubing choke and open casing total depth 3,662 feet. Same company's No. 4 Moore, top sand 3,669 feet, initial production 121 bbls. per hour through three-quarters tubing choke and open casing, total depth 3,674 feet.

Mabee's No. 2 Wilson, top Pecan Gap 2,630 feet, base 3,000 feet, top Austin chalk 3,455 feet, base Austin chalk 3,500 feet, sand 3,617-25 feet, initial production 234 bbls. per hour through tubing, total depth 3,625 feet. Humble Oil & Refining Co.'s No. 1 May Day Caldwell, top Pecan Gap 2,710 feet, base 3,104 feet, top Austin chalk 3,574 feet, base 3,731 feet, sand 3,731-55 feet, initial production 124 bbls. per hour through three-quarters-inch tubing choke, total depth 3,755 feet. Vitek's No. 4 Eaton, top Pecan Gap 2,751 feet, base 3,171 feet, top Austin chalk 3,651 feet, sand 3,785-3,805 feet, initial production 210 bbls. per hour open through tubing, total depth 3,805 feet.

Tidal Oil Co.'s No. 3 Pinkston, top Pecan Gap 2,755 feet, base 3,170 feet, top Austin chalk 3,645 feet, base 3,764 feet, sand 3,764-87 feet, initial production 152 bbls. per hour open through tubing, total depth 3,787 feet. Kirby Petroleum Co.'s No. 1 Joe Williams, top Pecan Gap 2,689 feet, base 3,064 feet, top Austin chalk 3,525 feet, broken sand 3,782 feet, initial production 114 bbls. per hour through three-quarters-inch tubing choke, total depth 3,783 feet. Jackson-Wise and Snedden's No. 1 Wilson, top Pecan Gap 2,610 feet, base 3,-063 feet, top Austin chalk 3,469 feet, sand 3,626-57 feet, initial production 300 bbls. first 30 minutes through casing, total depth 3,657 feet.

Olsen Brothers' No. 1 Powers, top Pecan Gap 2,660 feet, base 3,060 feet, top Austin chalk 3,530 feet, base 3,675 feet, sand 3,675-85 feet, initial production 220 bbls. per hour through open tubing, total depth 3,685 feet. H. L. Hunt's No. 2 I. R. Thrash, top Pecan Gap 2,730 feet, base 3,145 feet, top Austin chalk 3,657 feet, base 3,769 feet, sand 3,769-3,830 feet, initial production 200 bbls. per hour through tubing, total depth 3,830 feet. H. L. Hunt's No. 2 Plowman, top Pecan Gap 2,790 feet, base 3,200 feet, top Austin chalk 3,600 feet, base 3,748 feet, sand 3,748-90 feet, initial production 131 bbls. per hour through tubing, total depth 3,790 feet.

Humble Oil & Refining Co.'s No. 1 F. M. Wooley, top Pecan Gap 2,770 feet, base 3,116 feet, top Austin chalk 3,577 feet, base 3,733 feet, sand 3,733-55 feet, initial production 77 bbls. per hour through eleven-sixteenths-inch tubing choke, total depth 3,755 feet. Same company's No. 1 Shaw, top Pecan Gap 2,722 feet, base 3,149 feet, top Austin chalk 3,573 feet, base 3,750 feet, sand 3,750-55 feet, initial production 464 bbls. first 12 hours through eleven-sixteenths-inch tubing choke, total depth 3,755 feet. Same company's No. 3 Plowman, top Pecan Gap 2,747 feet, base 3,008 feet, top Austin chalk 3,547 feet, base 3,641 feet, sand 3,692-3,721 feet, initial production 87 bbls. per hour through eleven-sixteenths-inch tubing choke, total depth 3,721 feet. Same company's No. 2 W. A. Mullikin, top Pecan Gap 2,700 feet, base 3,106 feet, top Austin chalk 3,571 feet, base 3,705 feet, sand 3,705-82 feet, initial production 110 bbls. per hour through three-quarters-inch tubing choke, total depth 3,794 feet. Same company's No. 1 W. A. Mullikin, top Pecan Gap 2,667 feet, base 3,090 feet, top Austin chalk 3,537 feet, base 3,685 feet, sand 3,685-3,715 feet, initial production 105 bbls. per hour through three-quarters-inch tubing choke, total depth 3,780 feet. Same company's No. 2 De Guerrin, top Pecan Gap 2,681 feet, base 3,143 feet, top Austin chalk 3,578 feet, base 3,728 feet, sand 3,728-81 feet, initial produc-

tion 95 bbls. first hour through three-quarters-inch tubing choke, total depth 3,781 feet. Same company's No. 1 Jones Fuller, top Pecan Gap 2,659 feet, base 3,020 feet, top Austin chalk 3,485 feet, base 3,637 feet, sand 3,637-65 feet, initial production 123 bbls. second hour through three-quarters-inch tubing choke, total depth 3,665 feet. Same company's No. 1 First Guarantee State Bank, top Pecan Gap 2,680 feet, base 3,083 feet, top Austin chalk 3,530 feet, base 3,707 feet, sand 3,707-13 feet, initial production 70 bbls. per hour through three-quarters-inch tubing choke, total depth 3,713 feet. Same company's No. 1 R. T. Cameron, top Pecan Gap 2,677 feet, base 3,053 feet, top Austin 3,535 feet, base 3,657 feet, sand 3,657-83 feet, initial production 109 bbls. first hour through three-quarters-inch tubing choke, total depth 3,759 feet. Same company's No. 2 Blackwell, top Pecan Gap 2,671 feet, base 3,128 feet, top Austin chalk 3,536 feet, base 3,690 feet, sand 3,690-3,700 feet, initial production 45 bbls. per hour through eleven-sixteenths-inch choke, total depth 3,700 feet. Same company's No. 1 Barksdale, top Pecan Gap 2,708 feet, base 3,143 feet, top Austin chalk 3,586 feet, base 3,738 feet, sand 3,738-48 feet, initial production 85 bbls. per hour through three-quarters-inch tubing choke, total depth 3,748 feet.

Guerin-King-George's No. 1 W. P. Keeling, top Pecan Gap 2,749 feet, base 3,155 feet, top Austin chalk 3,643 feet, sand 3,725-72 feet, initial production 145 bbls. per hour open through tubing, total depth 3,772 feet. Golding and Murchison's No. 2 Blackwell, top Pecan Gap 2,675 feet, base 3,060 feet, top Austin chalk 3,508 feet, base 3,612 feet, sand 3,674-92 feet, initial production 175 bbls. per hour open through tubing, total depth 3,692 feet.

Federated Oil Corp.'s No. 4 Camp, top Pecan Gap 2,589 feet, base 2,999 feet, top Austin chalk 3,496 feet, base 3,614 feet, sand 3,623-32 feet, sand 3,636-56 feet, initial production 1,500 bbls. per day through casing, total depth 3,659 feet. East Texas Refining Co.'s No. 1 J. Bell, top Pecan Gap 2,770 feet, base 3,196 feet, top Austin chalk 3,607 feet, base 3,771 feet, sand 3,771-93 feet, initial production 101 bbls. first 30 minutes through open tubing, total depth 3,793 feet. Droppleman Development Co.'s No. 1 Cox, top Pecan 2,640 feet, base 3,015 feet, top Austin chalk 3,576 feet, base 3,721 feet, sand 3,721-43 feet, and 3,750-65 feet, initial production 80 bbls. per hour open through tubing, total depth 3,765 feet. Devonian Oil Co.'s No. 2 Millstead, top Pecan Gap 2,678 feet, base 3,105 feet, top Austin chalk 3,530 feet, sand 3,623-37 feet, initial production 85 bbls. per hour through open tubing, total depth 3,673 feet.

E. L. Chapman's No. 1 Jesse Menschew, top Pecan Gap 2,718 feet, base 3,122 feet, top Austin chalk 3,652 feet, base 3,745 feet, sand 3,745-75 feet, initial production 135 bbls. per hour through eleven-sixteenths inch tubing choke, total depth 3,775 feet. Blackwell Oil & Gas Co.'s No. 1 Samp Stone, top Pecan Gap 2,708 feet, base 3,130 feet, top Austin chalk 3,529 feet, base 3,570 feet, sand 3,670-3,700 feet, initial production 225 bbls. per hour open through tubing, total depth 3,700 feet. Baldwin and Sultan's No. 1 M. L. Thompson, top Pecan Gap 2,700 feet, sand 3,688-3,736 feet, initial production 230 bbls. per hour open through tubing, total depth 3,736 feet. Arkansas Fuel Oil Co.'s No. 1 Harmon, top Pecan Gap 2,720 feet, base 3,126 feet, top Austin chalk 3,627 feet, sand 3,747-70 feet, initial production 145 bbls. per hour open through tubing, total depth 3,770 feet.

Smith County

J. H. Brogan trustee's No. 1 T. O. Wright, top Pecan Gap 2,695 feet, base 3,127 feet, top Austin chalk 3,535 feet, sand 3,684-3,714 feet, initial production 166 bbls. per hour pinch through tubing, total depth 3,714 feet. Sinclair Oil & Gas Co.'s No. 2-B Jarvis, top Pecan Gap 2,700 feet, base 3,055 feet, top Austin chalk 3,505 feet, base 3,652 feet, sand 3,670-85 feet, initial production 200 bbls. per hour open through tubing, total depth 3,685 feet. H. L. Hunt's No. 3-A Fair, top Pecan Gap 2,650 feet, base 3,050 feet, top Austin chalk 3,475 feet, base 3,655 feet, sand 3,664-92 feet, initial production 310 bbls. per hour through tubing, total depth 3,692 feet. Pointer Oil Co.'s No. 1 Wright, top Pecan Gap 2,703 feet, base 3,070 feet, top Austin chalk 3,487 feet, base 3,654 feet, sand 3,654 feet to 80 feet, initial production 258 bbls. first hour open through tubing, total depth 3,680 feet.

Upshur County

R. M. Weaver, Jr., and others' No. 1 L. J. Everett estate, oil sand 3,615-19 feet, initial production 105 bbls. per hour through three-quarter inch tubing choke, total depth 3,619 feet. Magnolia Petroleum Co.'s No. 2 Howard Hampton, oil sand 3,604-08 feet, and 3,612-19 feet, initial production 500 bbls. per hour through open casing and 1-inch tubing choke, total depth 3,619 feet. Same company's No. 3 Howard Hampton, oil sand 3,603-06 feet and 3,609-28 feet, initial production 462 bbls. per hour through open casing and 1-inch tubing choke, total depth 3,628 feet. Humble Oil & Refining Co.'s No. 1 A. O. Phillips, oil sand 3,627-45 feet, initial production 54 bbls. per hour through three-quarter inch tubing choke, total depth 3,645 feet.

Limestone County

George McCamey's No. 1 B. K. Arnett, dry and abandoned, total depth 1,685 feet.

Lamar County

Doyle and Jondreau's No. 1 J. A. Guest, dry and abandoned, total depth 2,705 feet.

Cherokee County

Grey and others' No. 1 Hardaway estate, dry and abandoned, total depth 4,154 feet.

Van Zandt County

Pure Oil Co.'s No. 1 M. L. Gilbert, initial production on eleven-sixteenths inch choke 192 bbls., total depth 2,915 feet. Same company's No. 1 J. C. Stewart, dry and abandoned, total depth 2,996 feet. Humble Oil & Refining Co.'s No. 13 Black, top Pecan Gap 1,770 feet, base 1,920 feet, top Austin chalk 2,275 feet, base 2,300 feet, sand 2,347-2,885 feet; initial production 164 bbls. first three hours on eleven-sixteenths inch choke, total depth 2,885 feet.

SPECULATING ON EAST TEXAS PRODUCTION

(Continued from Page 13)

August. Following that there may be a tendency for the line to flatten out but that remains to be seen. A number of rotary outfits, it is reported, are being stacked throughout East Texas because of unprofitable operation, which is indicated in the graph which shows a substantial decline in the total number of drilling operations for the week ended June 29. However, it is generally expected that the majority of the remaining rotary outfits will continue in operation over and over again and that a substantial number of completions may be expected each week for months to come.

Speculating on Future Production

As to production of the district during the remainder of the year and the determination of the average output per well, that is a more speculative question. As this is written, the State Railroad Commission has just issued a proration order setting the allowance for East Texas for the proration period for the first month of the three months from July 1 to October 1. The order sets 250,000 bbls. as the total daily allowance, this to be distributed ratably according to potentials and units. If the allowance is enforced, the daily average yield per well will be approximately 122 bbls. on October 1. This is on a basis of 2,045 wells having been completed by October 1. Most any pumping well in the district possibly could make that amount of oil so there need be but very little deduction from the total number of completed wells in the field for those which have ceased to flow. While it is not likely that the same allowance of 250,000 bbls. will be carried over for the last quarter of the year, if it should, the daily average production per well for the 3,070 wells expected to have been completed by that time will be only a fraction over 81 bbls. It is anticipated, however, that the allowance for East Texas will be increased gradually and that by the end of the year it will be approximately 500,000 bbls. With this amount of production the daily yield per well would be a fraction under 162 bbls.

Enormous Shipping Facilities

The outlet capacity of East Texas, including pipe lines, loading racks and local refineries, after September 1 will total 800,000 bbls. While it is not likely that the field will be permitted to operate at that capacity, there is no doubt but that it could produce that amount of oil at that time, and now. If for any reason the production should be opened to that figure, on the basis of 3,070 wells on January 1, the average yield per well would be slightly above 260 bbls. The possibility of salt water intrusion would act as a possible restraint to the opening of the field to that extent as production of the field probably could not be held up at that figure any great length of time.

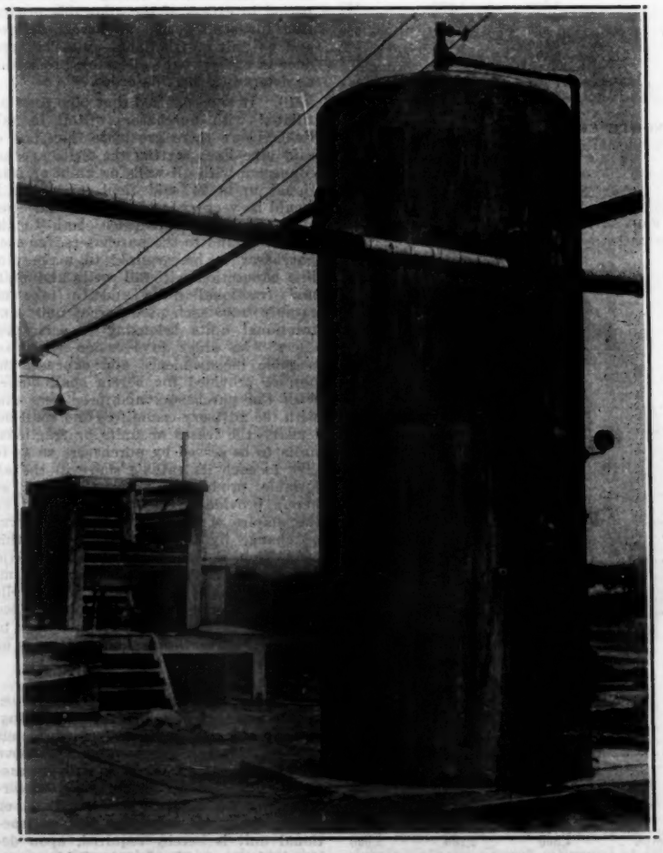
In connection with discussion of proration of East Texas, some operators have favored a plan whereby each well would be restricted to a uniform maximum production regardless of the potential. At the recent proration hearing before the State Railroad Commission the recommendation was made that an order be issued limiting the production of each well to 250 bbls. Under this plan, using a completion curve based on past and present performance, East Texas on July 1 would have been allowed a production of only 256,250 bbls. On August 1 the production of the field would be 343,750 bbls.; on September 1 it would be 428,750 bbls.; October 1, 511,250 bbls.; November 1, 597,500 bbls.; December 1, 682,500 bbls.; and on January 1, 767,500 bbls. Thus on January 1, the production would be nearly equal to what the outlet capacity will be on September 1.

SIMPLIFY GASOLINE TREATING PROBLEMS

(Continued from Page 29)

powder will sweeten only 837 gallons of the same gasoline.

In other words, chlorine in the form of HTH showed a sweetening efficiency 1.38 times that of chlorine in the form of bleaching powder. There is no ready explanation for this greater treating efficiency of HTH, but similar results have been observed by a number of operators and chemists.



Hypochlorite treating plant at the Pearson plant. In the right foreground is the orifice mixer, the vertical settling tank and in the background is the mixing or supply tank. The aerating device above the supply tank is no longer used.

TO START EXPERIMENTAL PLANT AT CALGARY SOON

(Continued from Page 106)

tio. "I understand," said Doctor Boomer, "that Turner Valley is producing about 1,500,000 bbls. of naphtha yearly at present. This quantity of benzine, I believe, could be recovered, and there would be as much if not more gas left for consumption."

A surprising feature of the process is that after extraction of the benzine, the actual volume of gas remaining is larger than before; though the heat value is a little less.

Doctor Boomer stated that benzine was in excellent market demand and for this reason was the most commercial of the many products obtainable from the Turner Valley waste gas. Other products obtainable ranged from wood alcohol to hydrogen; but at present none of these appeared to be commercial propositions except the benzine. By means of chlorinization of the waste gas, methyl or wood alcohol could be produced, but for this product there was not sufficient market. Ammonia could be produced by means of oxidization but very large capital would be required to make the production commercially feasible. Another product, naphthalene, had a very limited market, chiefly for the production of moth balls, though other uses were being sought.

JULY REFINERY OPERATIONS AT NEW PEAK

(Continued from Page 16)

REFINERY OPERATIONS IN KANSAS

(Plants which have been in operation during the past year)

Company and location—	Daily capacity	Runs July 1	Runs June 1
Altitude Petroleum Corp., Chanute	5,000	3,000	2,000
Barnsdall Refineries, Inc., Wichita	4,000	3,250	2,200
Derby Oil Co., Wichita	7,500	4,000	4,000
Eldorado Refining Co., Eldorado	4,500	3,000	3,000
Golden Rule Refining Co., Wichita	1,500	850	1,000
Kanotex Refining Co., Arkansas City	12,000	9,500	7,000
National Refining Co., Coffeyville	6,500	5,000	4,000
Phillips Petroleum Co., Kansas City	6,000	7,600	6,000
Shell Petroleum Corp., Arkansas City	22,000	15,000	14,000
Sinclair Refining Co., Coffeyville	12,000	11,000	10,000
Sinclair Refining Co., Argentine	9,500	5,000	5,000
Skelly Oil Co., Eldorado	23,000	15,100	14,000
Standard Oil Co. of Kansas, Neodesha	20,000	8,000	7,000
Vickers Petroleum Co., Potwin	3,500	2,000	2,800
White Eagle Oil Corp., Augusta	13,000	10,000	13,000
Total	150,000	102,700	95,000

REFINERY OPERATIONS IN NORTH LOUISIANA

(Plants which have been in operation during the past year)

Company and location—	Daily capacity	Runs July 1	Runs June 1
Bayou State Refining Co., Hosston	750	300	200
Crystal Oil Refining Co., Shreveport	14,000	(*)	(*)
D'Artois Oil Refining Co.	50	25	25
Louisiana Oil Refining Co., Shreveport, Bossier	19,000	16,000	16,000
Spartan Refining Co., Shreveport	10,000	9,000	9,000
Stanolind Oil & Gas Co., Superior	3,500	2,800	2,800
The Texas Company, Shreveport	7,000	5,000	(*)
Total	54,300	33,125	28,025

*Shut down.

REFINERY OPERATIONS IN WEST TEXAS

(Plants which have been in operation during the past year)

Company and location—	Daily capacity	Runs July 1	Runs June 1
Big Spring Refining Co., Big Spring	2,500	900	1,000
Big Lake Refining Co., Big Lake	2,000	(*)	(*)
Bluebonnett Oil Refining Co., Wickett	5,000	(*)	(*)
Burford Oil Co., Pecos City	6,000	5,500	5,300
Coltex Refining Co., Colorado	10,000	6,800	6,800
Cosden Oil Co., Big Spring	15,000	7,500	7,500
Deer Oil Corp., Luling	2,500	(*)	(*)
Grayburg Oil Co., San Antonio	6,000	1,000	(*)
Great West Refining Co., Big Spring	3,500	3,000	3,000
Gulf Oil & Refing Co., Sweetwater	5,000	5,000	5,000
Humble Oil & Refining Co., San Antonio	5,000	1,165	2,000
Humble Oil & Refining Co., McCamey	15,000	6,240	13,000
Magnolia Petroleum Co., Luling	5,000	5,000	5,000
Marathon Oil Co., Del Rio	5,000	1,800	1,800
Misko Refineries, Inc., Laredo	1,500	1,000	500
Mid-Tex Refining Co., Midland	2,500	(*)	(*)
Motor Fuel Products Co., Laredo	2,000	500	500
Pasotex Petroleum Co., El Paso	14,000	9,000	9,000
Pioneer Oil & Refining Co., Somerset	1,500	1,150	400
Richardson Refining Co., Big Spring	6,000	(*)	(*)
Rio Grande Oil Co., El Paso	6,000	(*)	(*)
San Angelo Refining Co., San Angelo	2,000	200	200
Sweetwater Oil & Refining Co., Sweetwater	2,000	(*)	(*)
The Texas Company, San Antonio	3,000	2,500	2,500
The Texas Company, El Paso	2,000	1,600	(*)
Tonkawa Petroleum Co., Pyote	5,000	1,500	1,100
Texas Mexican Oil & Refining Co., Laredo	600	500	500
Texas Petroleum Products Co., Somerset	1,500	1,000	700
Wickett Refining Co., Wickett	2,500	400	500
Total	147,600	62,655	66,300

*Shut down.

REFINERY OPERATIONS IN NORTH CENTRAL TEXAS

(Plants which have been in operation during the past year)

Company and location—	Daily capacity	Runs July 1	Runs June 1
Allstate Refining Co., Thrall	3,000	1,450	2,000
American Refining Properties, Wichita Falls	6,000	3,500	3,000
Archer Refining Co., Megargel	1,500	650	650
Atlantic, Pacific & Gulf Refining Co., Wichita Falls	5,000	(*)	(*)
Beacon Oil & Refining Co., Friars Switch	2,500	2,000	2,000
Central Texas Refining Co., Angus	4,000	600	600
Continental Oil Co., Wichita Falls	6,000	3,000	3,700
Dale Oil & Refining Co., Electra	4,000	3,200	2,500
Deer Oil Corp., Brownwood	2,000	(*)	(*)
Dixon Creek Oil & Refining Co., Kings Mill	3,500	2,500	3,000
East Texas Refining Co., Henderson	6,000	5,500	5,300
East Texas Refining Co., Longview	10,000	10,000	10,000
Empire Oil & Refining Co., Gainesville	5,000	3,600	3,600
Falls Refining Co., Wichita Falls	2,000	1,000	1,000
Gulf Refining Co., Fort Worth	10,000	5,600	5,800
Humble Oil & Refining Co., Breckenridge	2,000	700	(*)
Humble Oil & Refining Co., Chilton	4,000	1,400	700
Humble Oil & Refining Co., Boggy Creek	5,000	2,150	1,600
Independent Oil Refining Co., Arp	500	300	150
Iowa Park Producing & Refining Co., Iowa Park	2,500	1,000	500
Kent Refining Co., Minerva	2,000	500	500
LaSalle Petroleum Co., Burkburnett (Noble)	3,500	(*)	(*)
Macmillan Petroleum Co., Isom	8,000	5,000	6,000
Magnolia Petroleum Co., Fort Worth	12,000	4,500	4,500
Magnolia Petroleum Co. (White Eagle plant), Fort Worth	6,000	3,500	3,500
Magnolia Petroleum Co., Corsicana	5,000	5,000	5,000
Marathon Oil Co., Fort Worth	5,000	5,000	4,000
Muenster Refining Co., Muenster	300	50	40
Olney Oil & Refining Co., Olney	2,500	2,000	2,000
Oriental Oil Co., Dallas	5,000	1,000	1,000
Overton Refining Co., Overton	3,500	1,600	2,500
Panhandle Refining Co., Wichita Falls	5,000	3,830	3,300
Petroleum Refractionating Co., Pampa	6,500	6,500	6,100
Phillips Petroleum Co., Isom	15,000	15,000	15,000
Primrose Refining Co., Wichita Falls	2,500	2,500	2,200
Simms Oil Co., West Dallas	4,500	4,000	4,000
Southland Refining Co., Olney	1,000	200	200
Star Refining & Producing Co., Fort Worth	1,500	1,100	1,000
Slack Petroleum Corp., Camp Switch	1,500	630	....
Superior Refining Co., Tiffin	2,000	200	200
Tarrant Petroleum Co., Grand Prairie	2,500	(*)	(*)
Taylor Refining Co., Taylor	6,000	3,000	3,000
Taylor Refining Co., Tyler	15,000	8,000	10,000
Taxman Refining Co., Wichita Falls	2,500	2,500	2,000
The Texas Company, Dallas	16,000	15,000	15,000
The Texas Company, Amarillo	4,000	3,000	3,000
Thurber Refining Co., Thurber	500	300	200
Tidal Western Refining Co., Burkburnett	3,000	(*)	(*)
Texas Pacific Coal & Oil Co., Fort Worth	3,000	2,000	2,500
Texas Pacific Coal & Oil Co., Caddo	1,000	300	500
Waggoner Refining Co., Electra	3,400	2,400	2,400
Wilcox Oil & Gas Co. (Pampa Refining Co.), Pampa	4,000	2,500	2,000
Total	240,450	149,980	148,440

*Shut down.

REFINERY OPERATIONS IN ARKANSAS

(Plants which have been in operation during the past year)

Company and location—	Daily capacity	Runs July 1	Runs June 1
James H. Berry & Sons, Waterloo	2,000	1,000	1,000
Henry H. Cross Co., Smackover	6,000	4,200	4,000
Houston Oil Co., Camden	6,000	3,250	3,250
Kettle Creek Refining Co., Pearson	5,000	2,250	2,000
Lion Oil & Refining Co., El Dorado	12,000	7,400	6,600
Macmillan Petroleum Products Co., Norphlet	1,800	1,500	1,600
Ouachita Valley Refining Co., El Dorado	2,000	1,000	1,100
Root Refining Co., El Dorado	10,000	6,600	4,700
Simms Oil Co., Smackover	3,000	3,700	2,700
Union Asphalt Co., El Dorado†	.....	.....	.....
Total	47,800	29,900	26,950

†Reduces residuum purchased from Lion Oil & Refining Co. No crude run.

FULL TEXT OF NEW ORDER BY TEXAS COMMISSION

(Continued from Page 14)

the owners of all producing units and fractional units in the field.

6. The period beginning July 1, 1931, at 7 a. m., and ending July 15, 1931, at 7 a. m., and each semimonthly period thereafter at 7 a. m., on the first day of each month and ending at 7 a. m., on the sixteenth day of each month and beginning at 7 a. m. on the sixteenth day of each month and ending at 7 a. m. on the first day of the succeeding month, shall be taken as the proration periods hereunder.

No Air-Gas Lift

7. No air or gas lift artificially applied shall be used in the East Texas oil field.

The Water Table

8. The completion of any well within 10 feet of the water table constitutes a serious hazard and the commission will, from time to time, issue specific instructions as to the amount of maximum permissible penetration into the sand which will be allowed in various parts of the field, and, until authorized to contrary no well shall be drilled more than 25 feet into the producing sand, even though such depth is more than 10 feet above the water table.

9. No oil shall be produced in the East Texas oil field during any proration period in excess of the allowable production for such period as herein defined, and no unit or fractional unit shall produce in excess of the allowable production as determined by this order.

10. It is recognized that pipe lines affiliated with purchasers of oil in said field, where there are more than one of said pipe lines serving the field, are not connected with all wells or units or fractional units in said field, and that it would be very expensive and would occasion serious inconvenience, both to the producers and to the purchasers, for each purchaser to be required to make pipe line connection with all wells and units and fractional units and to take oil ratably from each producer of units and fractional units belonging to each producer. In order to occasion the least possible inconvenience and expense, the umpire provided for herein shall confer with the purchasers and producers and with the advisory committee and shall determine the leases or units or fractional units to be served by purchasers so as to give to each its ratable share in the allowable production from the field as herein provided. Such determination by the umpire shall be subject to approval or change by the commission. In this connection, it is hereby ordered that said pipe line carriers or purchasers shall immediately make connections with wells when the umpire shall have determined the leases or units or fractional units to be served by such pipe line companies or purchasers and so notified them.

Requires Affidavits

11. All persons, firms, or corporations are hereby prohibited from purchasing, transporting, or handling from any unit or fractional unit any oil produced above the allowable fixed for such unit or fractional unit and any person, firm, or corporation purchasing, transporting, or handling any oil from any unit or fractional unit is hereby required, upon demand of any umpire for the field or any other duly authorized representative of the commission, to furnish an affidavit of the amount of oil so purchased, transported, or handled each day.

12. All storage of oil in excess of the amount required in connection with the reasonable requirements and necessities of production, transportation, or refining of oil, is hereby prohibited as constituting unnecessary waste.

13. (a) The commission will appoint an umpire for the East Texas Field. He will be the agent and representative of the commission in the administration and enforcement of this order, subject at all times to the direction and the control of the commission.

(b) The owners of producing units and fractional units, and the owners of royalties in such units and fractional units, are directed to select a committee of 15 members for the purpose of working with the commission and its umpire and other representatives. Such committee shall be known as the East Texas Advisory Committee. In the selection of said committee each owner shall have a vote in proportion to his interest in the units and fractional units involved.

14. Anyone owning a unit or fractional unit, or interest therein, who may feel that the restrictions of production as provided for above and the method of distribution result in an injustice or inequality, as for instance, where there is more than one well on a unit or fractional unit and such wells would be allowed as a total the same amount of production which would be allowed if only one well had been drilled, then such person is directed to present the facts to the advisory committee, which will make a complete report, together with its recommendations to the commission, which shall take final action thereon in an effort, if possible, to remove unavoidable injustice and inequality. Irrespective of the number of wells on a unit or fractional unit, the daily allowable thereon shall not be more than 750 bbls., and such additional allowable as may be permitted hereunder shall be taken from wells upon such unit or fractional unit so as to avoid unequal withdrawals against offset wells.

15. The general order of April 4, 1931, applying to the entire State, as modified by order of April 29, 1931, is hereby modified, as far as it relates to the East Texas Field, and any conflicting provisions in said general order shall yield to the provisions of this order with reference to the said East Texas Field.

This case will be held open upon the commission's docket for such further order or orders as may be necessary to carry out the purposes and provisions hereof.

C. V. TERRELL, Chairman.
LON A. SMITH, Commissioner.
Attest: (Seal)
C. F. PETET, Secretary.

HANDLE SMALL OUTPUT

CHATHAM, Ontario, July 3.—A small production from the Wainwright, Alberta, field is being handled in the local refining plant of Associated Refineries, Ltd., near Wainwright. There are several wells pumping, and the aggregate production runs around 40 to 50 bbls. a day. The Associated plant has largely been overhauled, and towers and stills readjusted to handle additional production. Most of the output is sold direct to consumers at the refinery. Tank cars containing asphaltic base are being shipped regularly to the Alberta provincial government for use in road surfacing.

NEW GOVERNMENT SURVEY SHOWS GAIN IN CRACKING

(Continued from Page 105)

tion of cracked gasoline in 1930, although the East Coast district retained first place from the standpoint of percentage, that is, in the proportion of cracked gasoline to the total. Nearly half of the gasoline produced by the refineries on the Atlantic Seaboard is made by the cracking process. The production of cracked gasoline at California refineries showed a material increase in 1930, although the proportion to the total amounted to only 18 per cent, the lowest of any of the major refining districts. The Louisiana Gulf Coast district made the most notable gain in cracking activity; its percentage rose from 30 in 1929 to 45 in 1930.

Thirty-five different types of cracking processes are listed in this survey, as compared with 38 a year ago. Of the 35 types on January 1, 1931, only 6 were being actively licensed, 6 were in use at only a few refineries, several were practically obsolete but still in use, and a considerable number were being developed by one company. Where a cracking process is being developed by one company but no particular name has been assigned to it, the term "Own" is used. The number of processes being developed by one company has shown a rapid increase in the last few years. The development of pipe stills which can be used for either skimming or cracking indicates that the dividing line between these two refining methods will tend to disappear. The following table gives a list of cracking installations:

RECAPITULATION BY TYPE OF PROCESS

Type of process—	Jan. 1, 1931— Total units	Jan. 1, 1931— Ttl. cap., bbls. per day
Black	12	16,000
Burton	793	164,249
Carborundum	1	3,000
Coil cracker	2	8,000
Continuous high pressure	2	5,300
Controlled coil	2	4,500
Convertor	1	4,200
Cross	150	245,800
de Florez	6	13,550
Doherty	20	27,500
Donnelly	4	7,000
Dubbs	185	252,250
Fleming	2	800
Gyro	20	16,000
Holmes-Manley	115	233,900
Isom	115	179,150
Jenkins	46	66,150
Leamon	5	2,250
Lewis	4	6,200
Lients	1	6,000
Link	22	46,000
Louisiana coil	5	7,100
Ormont	4	1,000
Own	166	168,000
Pipe stills	3	13,000
Pratt	2	2,500
Pressure coke	13	22,000
Richmond	2	6,400
Skelly-Rittman vapor phase	2	2,500
Slagter	13	2,700
Snodgrass	14	4,972
True vapor phase	3	3,600
Trumble	1	750
Tube and tank	118	385,460
Vapor phase	3	4,200
Winkler-Koch	7	18,800
Others	..	....
Total	1,868	1,950,781

FACTORS WHICH ENTER INTO ABSORBER DESIGN

(Continued from Page 106)

evil, while the fractions heavier than butane take care of themselves, so that if we choose an oil rate that will absorb all the normal butane we require, it will be ample to recover all the pentanes and heavier fractions.

The most important factor necessary to recover all the pentanes and heavier is a good stripping of the lean oil.

Tests have been made that indicate that with an oil temperature of 80° F. all the pentanes and heavier can be absorbed if the vapor pressure of the lean oil is between 20 to 27 mm. of mercury. It would also seem that there is no advantage in stripping the oil down to 1 to 2 mm., for if all of this fraction cannot be recovered with 200 mm. oil the fault is probably in the absorber.

With the common type of absorber a recovery of 80 to 85 per cent of the normal butane is all that can be expected no matter how high the oil to gas ratio is carried. A high calculated recovery is due to a high oil to gas ratio and the results do not seem to justify this. The highest absorber efficiencies are shown where the calculated recoveries run from 40 to 80 per cent of normal butane.

Plant tests based on the above butane extraction have shown efficiencies ranging from 102 to 171 per cent for normal butant extraction. This seems to demonstrate an earlier statement that the fat oil leaving an absorber can be supersaturated with normal as well as isobutane and propane.

REFINERS MAINTAIN GASOLINE ADVANCE

(Continued from Page 12)

tion over the past year has been general as shown in the following table:

NATURAL GASOLINE OUTPUT
(Thousands of gallons)

	May, 1931	May, 1930
Oklahoma	42,600	54,000
Kansas	2,500	3,000
Texas	35,700	42,100
Louisiana	4,100	6,000
Arkansas	2,500	2,800
Total	87,400	107,900

The above table shows that natural gasoline production has declined in all of the Mid-Continent areas. The data by fields show that Oklahoma City is the only major pool where natural gasoline production is greater this year than last.

This decrease of 20,500,000 gallons in May production when compared with May last year amounts to a decline of 660,000 gallons daily, or approximately 80 cars in the Mid-Continent alone. The natural gasoline situation differs from the refinery market in that there is no prospect of increased production. Refiners can easily increase their crude oil runs to stills, as they are doing in several areas, and through increased gasoline production weaken their statistical situation if continued over any length of time.

In the case of natural gasoline, the decline in production has been brought about by curtailed field operations and it is improbable that this condition will change in the near future sufficient to make any material change in production. Production in the older fields is declining steadily and there are no new fields to offset these declines with flush production. The East Texas area, a threat to every other branch of the industry, does not concern the natural gasoline manufacturer for the reason that no plants have been built as a result of drilling approximately 1,000 wells in that area and it is certain that the natural gasoline output will never be large due to the lack of a large supply of gas. This large crude oil production without any accompanying natural gasoline output should in time react favorably for the natural gasoline manufacturers.

Gasoline and Naphtha

New business was slow in U. S. Motor gasoline, the first of the week at a price range of 2¾ to 3 cents. Trading continued active all of last week at 2½ and 2⅝ cents low. Some marketers were compelled to cover short sales at one-eighth to one-half cent loss. There was considerable interrefinery buying and inquiries indicate there is still some of this class of business to be placed.

The new East Texas refiners were taken care of the first few days of the month and in at least one case, a refiner was oversold and purchased from other refiners. The East Texas group will need additional business the latter part of the month and developments at that time will determine the market for the remainder of the month.

The buying of the past week reflected the changed conditions in regard to gasoline specifications. Most of the refiners who were in the market insisted on gasoline with a low endpoint and a high antiknock rating. Sales of 60° gravity 410 to 420 endpoint with a minimum knock rating of 60 octane were reported. Buyers usually had to pay one-eighth to one-fourth cent premium over the regular grade of U. S. Motor to secure this material.

The advance in the higher gravity grades has not been nearly as great as in the case of U. S. Motor. There is fair movement of 400 endpoint gasoline at one-eighth cent above U. S. Motor grade but there was practically no trading in the 390 and 375 endpoint grades during the week. There is a better demand for 350 and 360 endpoint grades of high gravity but they also have not shared in the U. S. Motor advance.

The advance in U. S. Motor gasoline stimulated the demand for naphthas and lower gravity grades of gasoline which could be purchased under the U. S. Motor price. The supply in Oklahoma was absorbed before the end of the week.

Natural Gasoline

Natural gasolines were fractionally higher the first of the week in both Oklahoma and Texas. Grade AA was quoted at 1¾ to 1⅞ cents and Grade A at 2 cents and the remaining grades at 1⅝ cents. These prices could be shaded at least one-eighth cent in Texas. Buying was steady although no large orders have developed.

Kerosene

Oklahoma refiners are maintaining their prices fairly well despite low priced competition in Texas. Most Oklahoma refiners are maintaining a plant operating policy of keeping their kerosene output in line with the requirements of their regular trade. For that reason relatively little specification material is being forced on the spot market. Most refiners are quoting a low of 1⅞ cents for 41-43 water white against a price of 1½ to 1¾ cents in East Texas and North Texas.

Fuels

The quoted prices on the higher gravity grades of fuel oil were reduced this week. The highest gravity material ranging from 26 to 30 gravity of low cold test has been sold in Oklahoma as low as 40 cents. The quantity offered at these prices is not large but it is enough to make the low of the market.

Prices on high cold test material vary almost from sale to sale. Some sales of East Texas 24 gravity have been made on a Group 3 with a net back at the East Texas refinery of 5 cents per barrel. Oklahoma City and Panhandle material is available at 15 to 20 cents per barrel basis Group 3.

Gas Oil

The gas oil situation has not improved. Several refiners have considerable quantities on hand and they are offering all grades. U.G.I. and high cold test grades, varying in gravity are available from several sources at three-fourths cent per gallon and sales at five-eighths cent are reported. The low cold test, low flash grades are usually offered at a low of 1⅛ cents.

Furnace Oils

Based on sales made the past week all grades of furnace oil are selling over the same price range. At least, the lows are the same, starting at 1¼ cents for low flash and low cold test material. The high gravity, prime white grades are not in as much demand as some of the lower gravity grades except for tractor fuel.

Lubricants and Wax

About the only change in lubricating oil situation was the report from two manufacturers that they were sold up on bright stocks. This is the first report of this kind in several months. Prices on all products are unchanged.

There has been some trading in wax, both domestic and export, on basis of 1¾ cents for 124-126 material.

P. J. WHITE, NATIONALLY KNOWN OIL MAN, DIES IN SHREVEPORT, LA.

SHREVEPORT, La., July 6.—Patrick Justin White, 58, oil operator, and one of Shreveport's most lovable citizens, died at his home, 2703 Fairfield Avenue, at 9:45 p.m. Friday. Death was caused by a heart attack, superinduced by a recent siege of typhoid fever.

Coming to Shreveport in 1916 from Tulsa, Okla., where he already was well known in the oil industry, Mr. White assumed a place of first importance in the local oil fraternity.

Besides the widow, he is survived by one son, Patrick, 16; his father, Patrick White, of Warren, Pa.; one brother, Thomas White, New York; and one sister, Miss Catherine White, also of Warren. No funeral arrangements have been made.

Mr. White was born in Warren County, Pennsylvania, January 16, 1873. While yet a young man, he engaged in the oil well supply business and later transferred his activities to Tulsa, where he was associated with Harry Sinclair in the firm of White & Sinclair, with large holdings in the Cushing Field. He withdrew from this connection and was one of the founders of the Exchange National Bank of Tulsa. He married Miss Frances Laing in 1914.

After coming to Shreveport Mr. White organized the White Oil Corp. Later he severed his connections with this company and with his brother remained in the oil business as independent producers.

He was interested in the Homer Field and later acquired properties in the Wichita Falls, Tex., field, which he retained until his death. Lately he had become interested in the East Texas area. It is believed that he contracted typhoid fever while on a trip to that territory.

Expressing regret at Mr. White's death, associates said that he was a lovable character and, despite his prominence in the business world, was modest and retiring to an unusual degree.

Mr. White was a member of St. John's Catholic Church.

The funeral was held this afternoon.

Patrick J. White

The Rev. M. A. Grace, pastor of St. John's Catholic Church officiated at rites held in the church at 5 o'clock. Burial was made in Forest Park Cemetery.

JAMES W. FINNELL DEAD

James W. Finnell, for years a drilling contractor, died at his home in Tulsa on Saturday, July 4. Mrs. Finnell and several brothers and sisters survive. The funeral was held in Tulsa on July 6. Services were conducted in Christ King Church. Mr. Finnell had been ill for some time with an affection of the heart.

CHARLES CULLEN DIES

Charles Cullen, associated with the William Powell Co. since 1891, died at Latonia, Ky., recently. He will be remembered by those who attended the National Association of Power Engineers conventions as in charge of the Powell exhibit and a general favorite.

RATES OF SOLUTION OF CRUDE OIL AND GAS

(Continued from Page 15)

cally, we could determine (aside from the specific constants involved) the sort of process which would occur in a system of this sort. This may be done by analogy to the mathematical analysis of heat conduction. Take the case of a slab of solid material, the temperature of one face of which is suddenly raised to, and maintained at, a higher temperature. The flow of heat into this body should be entirely analogous to the absorption of gas by the system we have been using in these experiments. We have worked out such a theoretical basis by using the heat flow analogy, and it has been very useful to us.

We find a rather satisfactory agreement between the theoretical analysis and the actual results which we have obtained. The equations, unfortunately, for this diffusion process get rather complex. I won't try to derive them for you. I have a derivation to show any of you who are interested.

It is not feasible to admit gas to the cell continuously. Instead, it must be let in at intervals; and if we were working at a pressure of 300 pounds we would fill the space up to 301 pounds and let it stay shut up until the pressure gradually dropped to 299 pounds, and then bring it back to the 301 pounds, doing that in such a way that the time below 300 pounds was equal to the time above. We were, therefore, working at what was substantially the pressure we desired.

After the start of a run, the procedure consisted of measuring the amount of gas admitted up to definite times. The experiments lasted for a good many continuous hours for the men who were taking the readings in the laboratory. At the end of a certain length of time, when the process was carried perhaps 50 per cent to saturation, we had definitely determined the constant for the rate of solution. As you will see, in the experimental results we were able to determine the constants from runs of this length and, therefore, for the sake of saving time most of our runs were stopped somewhere around 50 per cent of saturation.

Saturation Value as Basis of Comparison

In order to know what the quantity of gas dissolved was for complete saturation, at the end of the rate run the process was carried to completion in a hurry by agitating the cell. In that way, on the same liquid and the same gas we obtained a saturation value to serve as a basis of comparison for the results as we went along. If you made a plot using the distance below the surface of the liquid in the cell as abscissae, calling the surface zero, and the percentage of saturation in the solution as ordinates, the curve would start at a point corresponding to zero depth and complete saturation, and would then drop off with increasing depth below the surface to zero per cent saturation. The curve would change with time, as the diffusion process advanced. This curve of distribution of molecules can be obtained for a given case by means of the probability function. I will show you, a little later, a typical distribution curve of this type. If you have an infinite depth of liquid, the molecules in the forefront never reach the end, of course. If the farthest molecules reached the bottom of a finite cell, then you would have a different situation. The concentration at the forefront, instead of being practically zero, begins to build up, thus lowering the overall concentration gradient. When the solution is completely saturated, you have a concentration gradient of zero, and the curve becomes horizontal. It is obvious that the rate of absorption will be different during this period. The concentration gradient is decreasing all the time, but there is bound to be a slower process during the later stage than at first. This will be seen from the equations and the results we have obtained. The mathematical equations should, however, describe the process from the beginning to end by use of the same diffusion constant throughout.

Where a volatile oil is used, the air is largely displaced by the vapors. If it is a relatively nonvolatile oil, it will be saturated with air at atmospheric pressure. The partial pressure of the air will not change during the process, in spite of the fact that the total pressure will be raised. We have felt that the error introduced in this way was small, and that any thorough removal of air would introduce greater errors.

Figure 1 shows some of our solubility apparatus. We have used high-pressure natural gas from the Santa Fe Springs Field. It was let in through a valve into our charcoal cell. This charcoal cell, which was wound with an electric heater, was previously baked out very thoroughly and evacuated for a considerable period in order to get any gas and adsorbed material from the charcoal. Then gas was run from a high-pressure tank, which was usually filled to around 900 to 1,000-pound pressure, and was only used until the pressure was nearly down to our working pressures. This avoided the necessity for a compressor in this phase of our work. This charcoal treatment removed heavier hydrocarbons and gave a gas of about 98 per cent methane content.

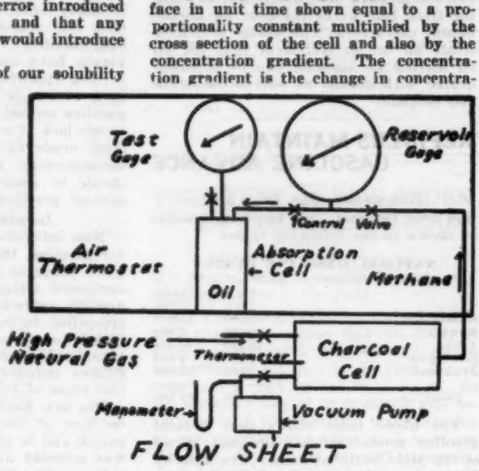


Figure 1.

Gas leaving the charcoal cell passed up through a valve into the reservoir system, which was discussed previously. After the oil had been placed in the absorption cell and the flanged top tightly bolted down, the gas was admitted to the cell until the pressure reached the desired value, and the process continued as outlined.

The part of the apparatus inclosed in the large rectangle in Figure 1 was in the thermostat maintained within about one-tenth of a degree of the temperature at which we worked, 86° F.

Ben E. Lindsly (United States Bureau of Mines): In letting in gas into your oil in your oil container there, how do you keep the stream of gas from disturbing and agitating the oil?

Mr. Lacey: I think I can show you in Figure 2, which is a cross section of the cell which we actually used. It gives dimensions, but I am not sure you can read them. I will try to supply any you are interested in. It is about 4 inches high and 1.4 inches in diameter. The gas was admitted through a fitting in the top, and met a deflector at this point which spread the gas stream out giving it a horizontal component, rather than a straight downward direction. We tried at first without that deflector, and found it was very necessary to have it. Another fitting led to the pressure gauge. There was a blow-off valve which was used for releasing the pressure. Our oil filled the cell initially to a depth of about 3 inches.

This gauge was our reservoir gauge, which gave the measure of the volume of gas admitted. Of course, the volume of the gas admitted was the initial volume of reading of the gauge minus the reading afterward. In other words, it was a question of difference from its original reading to the final reading to get the amount of gas admitted.

Fundamental Equation of Diffusion

Figure 3 indicates the fundamental equation of diffusion in which we have the quantity of gas going past the surface in unit time shown equal to a proportionality constant multiplied by the cross section of the cell and also by the concentration gradient. The concentration gradient is the change in concentration on moving a small distance downward in the cell. Of course, this is a differential equation, and is only applicable to an actual case as a summation. This has to be integrated in a rather elaborate way, and the general form of the integral is given by the second equation.

This shows that the quantity of gas dissolved divided by the quantity required for saturation (in other words, the fraction of saturation attained) is going to be such a function as shown of the depth of the cell L and the time T. M is the number of the term, since this turns out to be a summation of a number of terms, which for a complete solution varies from one to infinity. Now, that is a rather terrible thing to try to work with, but, fortunately, it can be simplified for special cases.

$$\frac{\partial Q}{\partial t} = -KA\frac{\partial C}{\partial x}$$

$$\frac{Q}{Q_s} = 1 - \frac{8}{\pi^2}\sum_{m=0}^{m=\infty}\frac{1}{(2m-1)^2}\,e^{-\frac{\pi^2 Kt}{4L^2}(2m-1)^2}$$

$$Q = 2C_s A\sqrt{\frac{Kt}{\pi}}$$

$$\frac{Q}{Q_s} = 1 - \frac{8}{\pi^2}e^{-\frac{\pi^2 Kt}{4L^2}}$$

Figure 3.

In the case where the gas has not reached the bottom, this expression simplifies to that shown in the third line of the figure, in which the quantity of gas dissolved is proportional to the concentration at saturation. Now, that takes into account the pressure involved, because as your pressure varies the saturation concentration varies with it. It is also proportional to the area and to the square root of the time. That is a point which I wish to bring out because the area in our case is constant, and for a given pressure the concentration at saturation is a constant; and, therefore, the quantity of gas going into solution should be proportional to the square root of the time. K is a constant, which we have called the absolute diffusion constant and for which we have obtained values in numerous cases and which we could substitute back and make calculations as to the quantity of gas which would go in during a given time.

During the last part of the run, when there are molecules piling up at the bottom of the cell and the concentration is changing there, one obtains an expression which is similar to the general one except that, in this case, for all practical purposes, the number of terms which you have to take into account becomes very small. Thus, you see this theoretically requires an infinite number of terms, but as saturation is approached all except the first term become very small in proportion to the first term. This allows a simple approximation of the correct value, which shows that the quantity of gas which dissolves is an exponential function of the time in this case, and the depth of the liquid is involved.

It is rather a bad thing to spring this on you without notice, but the two points I want to bring out are that during the first 50 per cent of saturation you have the quantity of gas dissolving proportional to the square root of the time, and that during the last half you have no longer that function but a function which is an exponential function of the time. In the first case, quantity of gas dissolved plotted against the square root of the time should give a straight line. I want to show you how that works out with our experimental results. Remember that the quantity of gas plotted against the square root of the time should be linear, but the quantity of gas plotted against the time itself should not be linear, but should be parabolic.

Probability Function

Figure 4 shows the probability function, indicating the actual distribution of the gas molecules in the liquid, during the process before 50 per cent saturation. It is to be noted that the concentration gradient is a variable with depth in the cell, being greater near the surface and less farther down.

This shows that, by the time the forefront molecules get to the bottom of the cell, you would not have 50 per cent saturation of your liquid. Fifty per cent saturation would be obtained when the

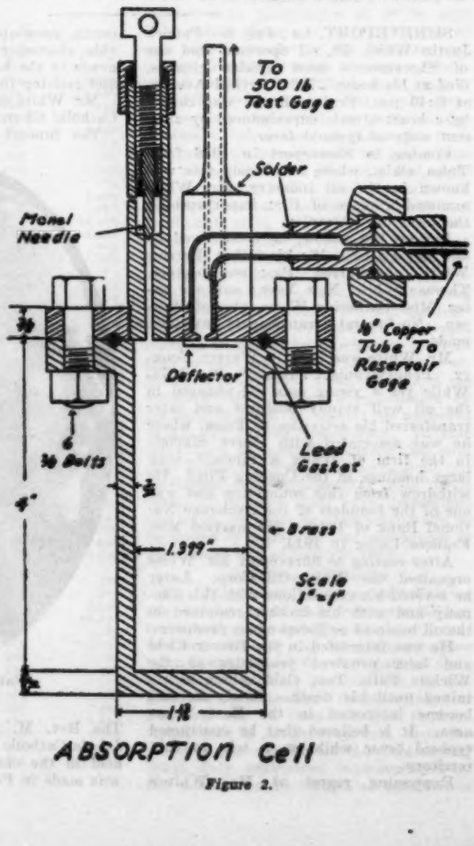


Figure 2.

concentration at the bottom has to come up to about 22 per cent; that is, you would have 22 per cent saturation at the bottom before 50 per cent saturation of the liquid as a whole would be reached. That is because of the fact that the curve sags down. If it were a straight line, the forefront molecules would reach the bottom at the time when 50 per cent saturation was reached.

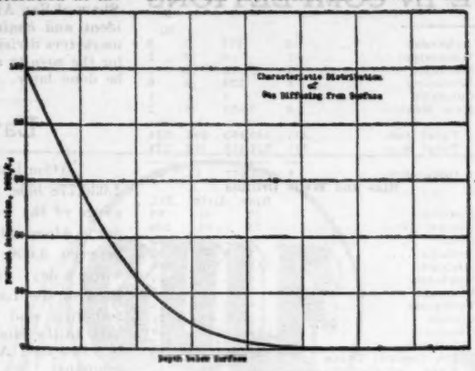


Figure 4.

Figure 5 shows a characteristic experimental curve. The points show the actual experimental values taken, plotting the number of cubic centimeters of gas dissolved against the time in hours. We have drawn in the parabolic curve through the points to give you some indication of the consistency of the points along the curve. The dotted curve above it is corrected for the fact that during the solution process the volume of liquid in the cell is increasing. That is rather an unfortunate thing to have occur, but it does occur and so we have to take it into account. By making measurements of the change in volume of the liquid as a function of the amount of gas dissolved we can determine from an experimental curve the extent to which this liquid had increased in volume at any particular stage of our process. The dotted curve is corrected for this change of volume of liquid, giving you an idea of the magnitude of that change. Naturally, the correction becomes larger as more gas is dissolved. This same data has been plotted in another way in the next curve.

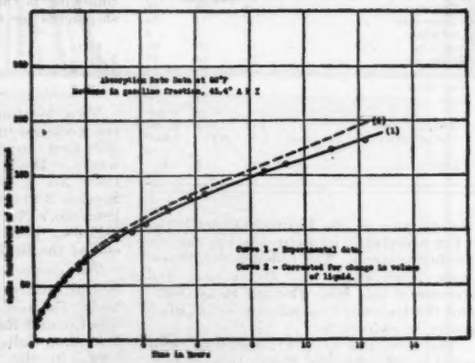


Figure 5.

Plotting Q against the square root of T should give a straight line. The upper curve of Figure 6 will indicate to us the way the corrected points from Figure 5 fall on this type of plot. You see that they fall very satisfactorily on a straight line curve, which agrees, therefore, with the hypothesis which we made that the surface becomes saturated very rapidly, and that from then on it is purely a diffusional process of gas molecules passing into the liquid. This upper curve resulted from putting the liquid in the cell at atmospheric pressure and then raising the gas pressure to 287.5 pounds per square inch and carrying on the saturation run at that constant pressure.

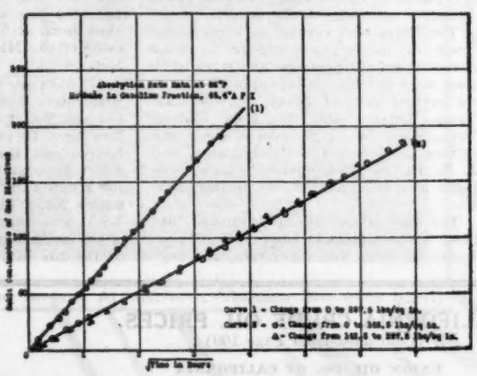


Figure 6.

Figure 6 also contains data from another experiment which we call a "split run." We made two more runs on the same gas and the same liquid (other samples, of course) in a similar way, except that first we raised the pressure to 143½ pounds per square inch, which is pretty close to one-half the pressure maintained during the previous run.

The circles on the lower curve indicate the points that were obtained on this run. You see again we have a straight line diffusional expression, but the slope now is very much less than it was before. After reaching about 50 per cent saturation as shown in the curve, the liquid was rapidly saturated at 143½ pounds. Then the gas pressure was suddenly raised from 143½ to 287½ pounds, corresponding to the other half of the pressure, which we used in the case of the upper curve, and carried out an exactly similar run; this time not starting with an oil containing no gas, but an oil saturated with gas at a pressure of 143½ pounds, merely putting some additional pressure on top of that. It may be seen that the slope which we get is not affected by having the initial oil saturated with gas, but is the same pressure increase.

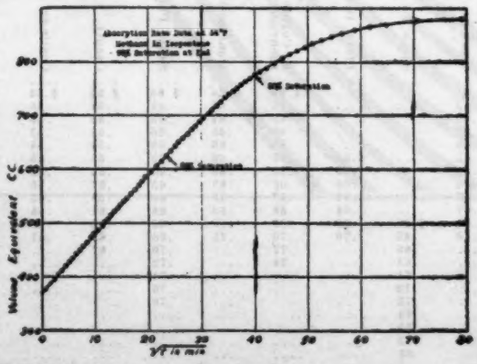


Figure 7.

Question: How many cubic centimeters of oil were there?

Mr. Lacey: I can't give you the figure offhand, but I think there were in the neighborhood of 80 c.c. You can calculate from the cell dimensions. The liquid is a little more than 3 inches in height, and about 1.4 inches in diameter. It is somewhere in the neighborhood of 75 or 80 c.c. of liquid.

Mr. Lindsly: In Figure 5 how did you calculate the increased volume of the solution?

Mr. Lacey: That is determined by taking the same materials and determining the increase in volume by means of an apparatus similar to that of Mills and Heithecker, in which we actually saturated the oil with gas and observed the change in volume. Our pressures are not very high; they only run up to about 300 pounds. The apparatus used was glass, and the change in volume measurements was made at 50 pounds, 100 pounds, 150 pounds, and we found the relation between pressure and change in volume to be a straight line. That was the basis on which we were able to make these corrections. The correction was rather a complex one, because the thing that really occurs is that the surface through which the gas is diffusing is moving upward and, therefore, you have to connect the movement of that surface and the actual change in volume.

Figure 7 represents a determination, with isopentane as the liquid and methane as the gas, which was carried to 99 per cent of saturation. You can see that up to the point where it was 50 per cent saturated, the curve is a straight line; beyond that the line begins to curve, and the farther you go the worse it gets. In other words, it changes from a straightline function into an exponential function. The point corresponding to 80 per cent saturation is also indicated. You can see that if you wanted to extend the use of the straight-line function to over 50 per cent, you could go a considerable distance beyond 50 per cent without making any appreciable error.

Figure 8 is a summary of results obtained on a series of prepared liquids, not natural liquids, but prepared in various ways to simplify the composition.

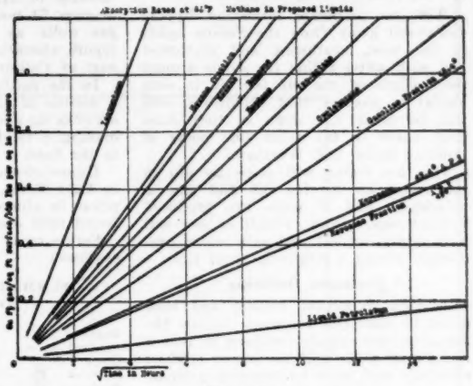


Figure 8.

Figure 9 shows runs with methane gas dissolving in four crude oils. The last three do not show any very great spread; they are very similar in their solution rates. Bradford, Pa., crude shows a distinctly higher rate. This shows, that if you have a square foot of surface area and apply a pressure of methane of 100 pounds per square inch, at the end of 100 hours Bradford crude would have dissolved through that square foot about half a cubic foot of gas. This may give you an idea of the order of the magnitudes involved.

Figure 10 shows two curves for the same materials, but for two different temperatures. This is interesting, because the diffusion rate is greater at the higher temperature in spite of the fact that the concentration gradient is smaller due to decreased solubility at higher temperatures.

Figure 11 shows a series of runs which was made in our cell, first with a liquid, and then with a sand which was filled with a liquid. The upper curve is for pure heptane, such as we saw in Figure 9. In this figure the plot is on a somewhat different basis. It is plotted as cubic feet of gas per square foot of effective oil surface. This effective surface is calculated by dividing the total pore space in the sand by the depth of the layer in the cell. This is, of course, considerably smaller than the cross section of the cell itself. We wanted to see whether the presence of sand really affected the behavior of the liquid; and this run with heptane showed slightly lower rate per unit of effective surface, although the actual rate was very much lower.

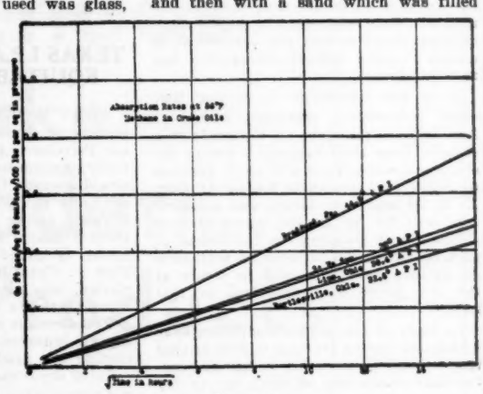


Figure 9.

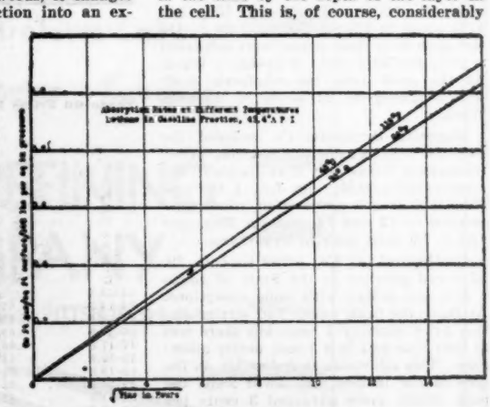


Figure 10.

(Continued in next issue)

SALT WATER IS ALREADY SERIOUS IN EAST TEXAS

(Continued from Page 17)

uplift during the period of deposition of the reservoir forming material.

With the producing formation dipping downward away from the Sabine uplift to the west, southwest and northwest and with water filling the sands around these edges of the oil pool it is only logical to assume that conditions here will be much the same as they have been noted in the fault line pools of Powell, Mexia and Wortham.

This hot water will move up dip in the formation as the oil and gas is withdrawn and if wells are produced without regard to this condition they will have badly cut oil and salt water production within a relatively short time.

Pressures Declining

Another important feature has been noted in that the pressures within the formation are rapidly declining so that a number of wells will no longer produce naturally and must be swabbed, pumped or put on the gas lift. There does not seem to be much tendency to go to the gas lift now because the volume of gas available is relatively small. Swabbing and pumping will be the first means resorted to in securing oil after the natural flowing period has passed.

If oil must be produced by these methods and when produced is badly cut and must be treated it is going to make it so expensive to secure that those operators who have contracted to deliver large amounts of oil at very low prices will be unable to make delivery except at a loss to themselves.

It is not reasonable to assume that small independent operators who have been inclined to secure all the production possible from their properties within the shortest possible time will be in position to fulfill such contracts for oil at from 10 to 20 cents per barrel and it therefore will be up to the purchasers to simply forego securing the fulfillment of such contracts and be satisfied with such oil as they have been able to secure at the low prices now prevalent in that field.

As most of the buying companies have withdrawn posted prices it is evident that they as well as the other companies contemplate purchasing oil from day to day from such producers as have it to deliver and when they can no longer produce oil under these competitive conditions such producers will simply fade out of the picture.

TANK WAGON CHANGES

(Continued from Page 110)

wholesale and retail prices to 15½ and 17½ cents in Phoenix, Ariz., July 3. On the same date these prices were advanced to 20½ and 23½ cents in Spokane, Wash. At the same time the wholesale price was advanced to 22 cents in Tacoma, Wash.

Magnolia Petroleum Co. reduced the gasoline tank wagon and station prices throughout Texas July 2 as shown in the accompanying table. On July 1 the gasoline tank wagon and station prices were reduced to 12 and 14 cents in Muskogee and to 14 cents each in Texarkana.

Continental Oil Co., effective June 29, advanced gasoline in the State of Idaho 1 cent per gallon with some exceptions. At Boise the tank wagon and service station price went up 1 cent, but there was at that time put in a 1-cent dealer allowance. This allowance is deductible on the face of the invoice. At Twin Falls the tank wagon price advanced 3 cents per gallon, service station and tank wagon being the same, namely 18 cents. There was put into effect at Twin Falls a 3-cent dealer allowance off tank wagon prices, which is applicable at the time of delivery.

Effective June 30 tank wagon price of commercial gasoline at Grand Junction, Colo., reduced 3 cents per gallon to 13 cents, service station price of 16 cents remaining.

JUNE FIELD OPERATIONS SHOW SMALL DECLINE IN COMPLETIONS

A decrease of 8 wells completed, an increase of 112,977 bbls. in initial production, 51 fewer dry holes and 57 fewer gas wells, as compared with the May report, characterize June field operations east of California.

In the matter of new work there was a decline of 138 in the number of new derricks up and a decline of 216 in wells drilling, a total decline of 354 operations in the field.

Unprecedented low price for crude oil in East Texas, which had a bearing on prices in almost all other areas, has affected field operations.

Following is the summary of June operations:

SUMMARY OF ALL FIELDS

Wells Completed

	Comp.	Prod.	Dry	Gas
Eastern	80	282	44	19
Central Ohio	39	202	15	18
Lima	10	25	4	4
Indiana	13	2	7	6
Michigan	7	265	3	2
Kentucky	23	180	2	12
Illinois	4	9	2	0
Tennessee	1	0	1	0
Kansas	47	21,260	14	12
Oklahoma	104	176,910	31	24
North Cent. Texas	73	4,392	41	2
E. Cent. and E. Texas	372	113,964	19	0
East Texas gas area	5	0	5	0
West Texas	32	2,708	15	1
Panhandle Texas	12	429	2	7
Gulf Coast	69	14,332	31	3
Southwest Texas	46	2,166	34	1
North Louisiana	25	1,390	11	6
Arkansas	4	175	3	0
Mississippi	1	0	0	1
Montana	3	15	1	1
Wyoming	5	226	2	0
Colorado	5	0	4	1
New Mexico	3	1,523	0	2
Total June	983	340,455	291	121
Total May	991	227,478	342	178
Difference	8	112,977	51	57

Rigs and Wells Drilling

	Rigs	Drlg.	Ttl.
Eastern	20	48	68
Central Ohio	25	95	120
Lima	4	18	22
Indiana	3	53	56
Michigan	58	102	160
Kentucky	9	88	97
Missouri	0	1	1
Tennessee	0	14	14
Illinois	2	19	21
Kansas	24	135	159
Oklahoma	54	279	333
North Central Texas	20	127	147
E. Cent. and East Texas	89	546	635
East Texas gas area	11	44	55
West Texas	11	94	105
Panhandle Texas	13	37	50
Gulf Coast	9	80	89
Southwest Texas	16	89	105
North Louisiana	16	50	66
Arkansas	8	28	36
Mississippi	6	12	18
Alabama	2	3	5
Montana	16	70	86
Wyoming	11	86	97
Colorado	8	73	81
New Mexico	5	51	56
Utah	1	19	20
Total June	441	2,261	2,702
Total May	579	2,477	3,056
Difference	138	216	354

TEXAS I.P.A. FAVORS EQUITABLE PRODUCTION

FORT WORTH, Tex., July 3.—At a meeting of the directors of the Independent Petroleum Association of Texas here today, announcement was made that it would sponsor legislation to bring about equitable production and equitable withdrawals among operators and pools in event a special session of the state legislature is called by Governor Sterling. Tom E. Cranfill, president of the association, was given authority to appoint a committee to sponsor such legislation.

The directors also are in favor of placing all branches of the oil industry, including the producing, transporting and refining departments under a new oil and gas conservation commission, in case one is created at the special session which will undoubtedly be called in a short while.

The attitude toward new legislation was assumed principally with the idea of bringing more power to bear on the pipe line bill now on the statute books, but which lacks sufficient backing to enforce the dictates of the Railroad Commission when ordering it into effect in the various producing areas. The Independent Petroleum Association was the author and sponsor of this bill. The bill lacks teeth, and the Railroad Commission lacks police power to enforce it.

The directors of the association also voted to take the East Texas Independent Producers Association and the Texas division of the Mid-Continent Royalty Owners Association into its organization. Clint Murchison of Dallas heads the first organization, and Lloyd Price of Fort Worth is president of the latter.

The State was divided into eight districts by the organization to facilitate carrying out the purposes and work of it, two new divisions being apportioned to the eastern part of Texas, i.e., the East Texas division and the East Central Texas area. W. C. Stroube of Corsicana is vice president of the latter area, and J. R. Parten of Longview is vice president and chairman of the former division.

The association was also divided into three main divisions, comprised of producers, refiners and marketers, and royalty owners. J. S. Abercrombie of Houston was made vice president and chairman of the former division, Grover C. Shaw of San Antonio was made vice president and chairman of the refiners and marketers division, but no one was chosen for the royalty owners division. This will be done later.

Late Fields

(Continued from Page 24)

1,036,778 bbls. of oil. The last potential gauge of the well was 229 bbls. of oil a day. Along with the oil the well makes between 4,000 and 5,000 bbls. of salt water a day. It will probably be plugged back to the Layton sand at 4,800-4,900 feet first and later it may be plugged back to the Hoover sand at approximately 4,000 feet. A south offset of the same company, No. 1 Emerson-Joyce, is plugged back to the Hoover sand gas, where it was completed.

Production from the Oklahoma City Field over the holiday was normal. The following is the production and pipe line shipments for the last three days:

Date—	Prod.	Wells	Shipments
July 4	215,881	123	207,707
July 5	107,673	73	201,729
July 6	236,163	97	198,237

Two locations were announced over the week end in the Oklahoma City Field, the first to be announced in several weeks. Denver Producing & Refining Co.'s No. 1 in the NW cor. SW NW, Section 3-11-3w, and the Phillips Petroleum Co.'s No. 1 Dehn, E cor.N, Section 3-11-3w, both locations in the north end of the field.

The deepest drilling well in the State is still rotating at a total depth of 8,450 feet. The test is the Mid-Kansas Oil & Gas Co. and Ramsey Petroleum Co.'s No. 6 Preston-Culp, NW cor. NE, Section 6-5-9w, in the Cement Pool, in Caddo County. The test was drilling in gray shale at 8,450 feet in what is believed to be the Pennsylvanian series.

Magnolia Petroleum Co.'s No. 2 Estes, SE cor. SW NE, Section 10-5-9w, on the east side of the Cement Pool, was shut down at 5,193 feet waiting the outcome of the Mid-Kansas Oil & Gas Co.'s test.

In the Carr City Pool, in the Greater Seminole area, Amerada Petroleum Corp.'s No. 1 Tiger, is swabbing and flowing. It swabbed 65 bbls. in five hours from the Wilcox sand at 4,194-4,210 feet, and flowed 145 bbls. from the Hunton in 24 hours. The same company's No. 2 Tiger, SE cor. SW, Section 3-8-5, was completed making 3,063 bbls. of oil in 24 hours from the Wilcox sand on the gas lift.

CALIFORNIA CRUDE OIL PRICES

(Continued from Page 100)

UNION OIL CO. OF CALIFORNIA

Crude Oil Prices for Its Purchases at the Well for Crude Produced in Strict Accordance With the Production Allocations Made by the California Statewide Curtailment Committee Effective 7 a.m., June 20, 1931

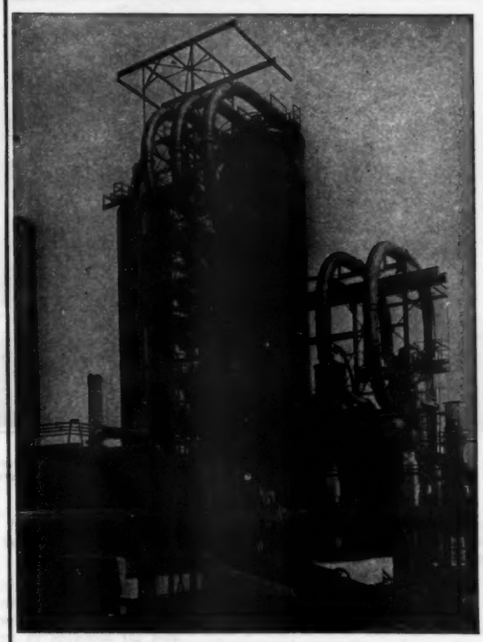
(All gravities above those quoted take highest price for that field)

Gravity °A.P.I.	Signal Hill	Alamitos Heights Seal Beach	Huntington Beach	Athens Rosecrans Dominguez	Torrance	Santa Fe Springs	Playa Del Rey*	E. Coyote Richfield	Montebello	Santa Paula	Orcutt	Coalinga	Lost Hills	McKittrick Kern River Sunset-Midway Elk Hills Buena Vista Hills	Gravity °A.P.I.
11-13.9	....	....	....	....	....	....	....	....	....	....	....	....	....	$.50	11-13.9
14-14.9	....	$.65	$.65	$.65	....	$.65	....	....	$.65	$.65	$.65	$.55	$.55	.55	14-14.9
15-15.9	....	.65	.65	.65	....	.65	....	....	.65	.65	.65	.55	.55	.55	15-15.9
16-16.9	....	.65	.65	.65	....	.65	....	....	.65	.65	.65	.55	.55	.55	16-16.9
17-17.9	....	.65	.65	.65	....	.65	....	....	.65	.65	.65	.55	.55	.55	17-17.9
18-18.9	....	.65	.65	.65	....	.65	....	....	.65	.65	.65	.55	.55	.55	18-18.9
19-19.9	....	.65	.66	.65	....	.65	....	$.65	.65	.65	.65	.55	.55	.55	19-19.9
20-20.9	....	.65	.65	.65	....	.65	....	.65	.65	.65	.65	.56	.55	.55	20-20.9
21-21.9	....	.65	.65	.65	....	.65	....	.66	.66	.65	.65	.57	.55	.57	21-21.9
22-22.9	....	.65	.65	.65	....	.66	....	.67	.67	.65	.65	.59	.55	.59	22-22.9
23-23.9	....	.67	.67	.67	....	.67	....	.68	.68	.65	.65	.61	.56	.60	23-23.9
24-24.9	....	.69	.69	.69	$.69	.66	$.65	.69	.69	.65	.66	.63	.55	.62	24-24.9
25-25.9	....	.71	.71	.71	.71	.70	.65	.70	.70	.65	.68	.65	.57	.64	25-25.9
26-26.9	....	.73	.73	.73	.73	....	.65	....	.72	....	.70	.67	....	.66	26-26.9
27-27.9	....	.75	.75	.75	.75	....	.68	....	.74	....	.72	....	....	.67	27-27.9
28-28.9	....	.77	....	....	.77	....	.71	....	....	....	.74	....	....	.69	28-28.9
29-29.9	....	.79	....	....	.79	....	.73	....	....	....	.76	....	....	.71	29-29.9
30-30.9	....	.81	....	....	.81	....	.75	....	....	....	.78	....	....	.72	30-30.9
31-31.9	....	....	....	....	.83	....	.78	....	....	....	....	....	....	....	31-31.9
32-32.9	....	....	....	....	.85	....	.55	....	....	....	....	....	....	....	32-32.9
33-33.9	....	....	....	....	.87	....	.83	....	....	....	....	....	....	....	33-33.9
34-34.9	....	....	....	....	.89	....	.85	....	....	....	....	....	....	....	34-34.9

*Subject to a gathering charge of 5 cents per barrel.

GULF

Modern Methods Make Modern Gulf Products



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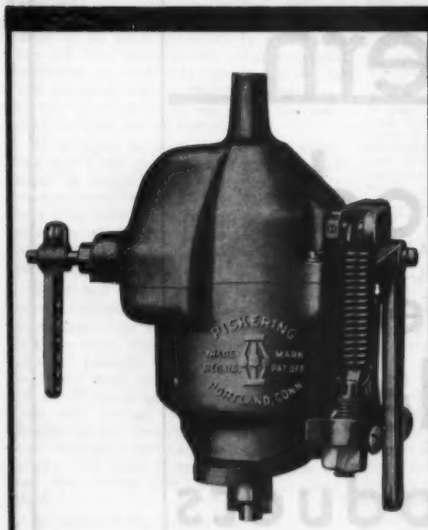

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THE PICKERING GOVERNOR COMPANY
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PICKERING GOVERNORS

SPECIAL EQUIPMENT FOR FIRE FIGHTING

(Continued from Page 22)

refinery followed the time honored method of depending largely on hose carts, carrying about 400 feet of 2½-inch line, with nozzles and axes, and stationed in fire supply houses located strategically throughout the plant. Each supply house is provided with extra equipment, such as axes, buckets, pike poles, fire plugs, and other fire-fighting implements. The portable foam equipment consists of a supply of the single type powder with a number of foam generators. In some areas the two-solution fire foam system is in service where gasoline and naphtha tanks are very close to one another. All tankage is, of course, connected to fire steam lines through which top steam may be introduced for smothering or for protection.

Generally, buildings are equipped with different types of fire extinguishers, the kind employed depending upon the nature of the machinery, stock, etc., in the buildings. In addition, most buildings are provided with hose reels, and fire steam lines.

The task of getting the hose carts, which are propelled by man-power, to the scene of the fire is a fatiguing one, and requires a large force. As a result, when the men moving a hose cart arrive at the fire they are too tired to be of much assistance until rested. This causes more or less delay and often results in confusion.

This obsolete method of getting equipment to a fire has been superseded by the use of motor-driven fire trucks. Each truck carries 40 cans of double type powder, a foam generator, 600 feet of 2½-inch hose, mixing hose, fittings for foam streams, and a foam tower. These foam towers, the plant's latest investment in fire foam equipment, are constructed of aluminum, and consist of a base, three sections, and a tip, the complete tower weighing only about 190 pounds. The value of such a tower was demonstrated shortly after acquiring it. A receiving tank 50 feet in diameter and 10 feet high containing heavy naphtha was ignited by falling sparks and the explosion which followed removed the roof and landed it 75 feet away. Two sections of the tower were used with the tip, and the fire was extinguished in exactly 10 minutes from the time the foam was applied.

A moderate priced chassis with a body built to best accommodate the equipment to be carried is all that is necessary. The cost of such an outfit will be returned in about two years by the savings on the hose that can be taken out of service, as it is not necessary to maintain so many hose carts; and fire hose, whether used or not, deteriorates rapidly. Fire hose no longer suitable for fire fighting may be advantageously used in the plant for washing condenser boxes, coolers, and other equipment.

Train Night Crews

To effectively fight fires at night when the number of men in the plant is at a minimum, the Whiting plant of the Standard Oil Co. (Indiana) organized and trained the available men on night shifts who could respond to all alarms without endangering process operations. This group consists of eight crews per shift with five men to a crew, each headed by a captain, who usually is a foreman. The captains were taken through the plant in order to get them acquainted with the locations of all fire supply houses, and with the equipment in them. The fire trucks are driven by the captains of the crews in the zones in which they are garaged. The other crews proceed at once to the fire also, but do not take any equipment. In case additional apparatus is needed the captains know the location of the nearest supply house from which to obtain it.

Rear view of loaded fire truck showing couplings for the three sections of the tower. The complete foam equipment, chemicals and 600 feet of hose are included on the one truck.

The value of training the men was very marked in the handling of the foam tower. A green crew took between 15 and 20 minutes in practice to assemble the tower and raise it to a vertical position. Operations are now performed by this same crew in less than one minute.

The problem of fire prevention and fighting is handled by a fire committee consisting of seven department heads or assistants with a member of the managerial staff as a member ex officio. The fire marshal is present at all meetings and assists with advice and practical working suggestions. The fire committee keeps in close touch with all manufacturers of fire-fighting equipment, and is continually conducting tests with a view to adopting the best on the market. It is believed advisable to standardize the equipment for this service as much as possible.

The fire committee has also undertaken an intensive study of fire prevention methods. Failure of equipment, due to corrosion, having been the cause of many refinery fires, a widespread campaign of preventive measures to stop the "bugbear of the industry—corrosion" has been instituted. In this connection a set of minimum standards for all vessels, lines, and valves under different operating conditions has been drawn up, and periodic measurements are made of equipment in service to observe the rate of corrosion. Much of this work is handled by the engineering department working in close co-operation with the operating force. When estimates for new construction are

being made up, the estimating department consults the fire committee as to the type of fire fighting equipment required. Many places can be protected from small blazes by the installation of hose reels with a one-man controllable nozzle. In some cases, especially around electrical equipment the use of water is to be avoided, which necessitates providing the proper nonaqueous extinguishers. In all cases providing the best available preventive and protective apparatus is specified.

Safety in Design

In the design of new constructioin, the drafting rooms are giving much more time and thought to fire prevention than was customary in the past, with the result that a tentative code of standards for fireproofing, fire preventive devices, and safety equipment has been adopted. Among the more important items constantly considered by designing engineers are the following:

1. All principal structural steel members supporting exchangers, drums, etc., should be fireproofed either with brick, asbestos, concrete or gunite on wire mesh reinforcement, and maybe protected with a galvanized iron weatherproof jacket.

2. Tower skirting and supporting lugs on towers should be fireproofed.

3. Steel building columns supporting condenser box girders should be fireproofed. Whether condenser box girders and beams should be fireproofed is an open question.

4. Each pump room should be provided with steam fire supply lines large enough to fill the room within two minutes. The valves for these steam lines should, of course, be controlled from the outside. (If a pump room has been steamed, it is important that all electric motors be given the regular breakdown test with the Meg-Ohm meter and those found faulty should be dried out and tester further before being placed in operation again.)

5. The columns of high scaffolding carrying heavy loads should be fireproofed.

6. Steel sash glazed with wire glass is preferred. The importance of wire glass has been emphasized in many fires.

7. Automatic fire doors may be used to advantage in walls nearest the stills. Where wood doors are used they should be metal covered.

8. Stanchions carrying important lines within the battery limits of stills, should be fireproofed. Reinforced concrete or gunite can be used to advantage. Standard asbestos pipe insulation with a galvanized iron jacket would also serve this purpose well. Important insulated lines are in many cases covered with galvanized iron.

9. In general, instrument rooms should be isolated by solid brick, tile, or concrete walls, thereby separating the expensive instruments from oil lines and pumps. All electrical equipment around stills should be vaporproofed.

10. If it is necessary to carry any oil lines or water lines through an electric control room or an instrument room, valves, fittings and joints should be located outside of the room proper, thereby reducing probable leaks to a minimum.

11. All sewer lines should be trapped before leaving the battery limits of stills. In fact, the drains from the various rooms should be trapped individually.

Careful design, improved and specialized fire-fighting equipment, trained crews working under capable and experienced leaders, do not complete the list of modern aids which the management of the Whiting refinery had adopted for keeping down fire loses. Prompt information on the progress of corrosion is also indispensable. The adoption of detailed and uniform testing methods for tanks and all other vessels, to insure absence of flammable vapors before welders or boilermakers are permitted to work, has done much to reduce hazard from this source. A vigorous and ceaseless campaign against surreptitious smoking is another essential. Last, but not least, a wide-awake safety department, well supported by the management, has engendered in the employes an alert attitude toward all working conditions without which the best material aids may be of small avail.

WILDCAT OPERATIONS IN OKLAHOMA

(Continued from Page 34)

OKFUSKEE COUNTY

E. L. Robinson's No. 1 Rice, NW Sec. 2-10-9 ..... Location.
Shepard et al's No. 1 Neveas, SE NW SW Sec. 3-12-10.. Shut down 3,690 ft.

OKLAHOMA COUNTY

Citizens Oil Co.'s No. 1 Sage Barber, NE cor. Sec. 21-11-2w ..... Shut down 1,200 ft.
L. C. Hivick's No. 1 Sunset Addition, NW SW NW Sec. 17-11-3w ..... Shut down 5,515 ft.
J. F. Cuniff, trustee's No. 1 Church Land, NE NW SE Sec. 17-12-4w ..... Shut down 6,700 ft.

PAWNEE COUNTY

Rookstool's No. 1 Wylie, NW NE SW Sec. 6-20-5 ..... Shut down 1,950 ft.
Sperry et al's No. 1 Mullrap, SE SW Sec. 2-22-5 ..... Drlg. 3,462 ft.
Cochran et al's No. 1 Green, NE cor. SW Sec. 15-23-5 .... Rig.

PITTSBURG COUNTY

J. Morrison's No. 1 Fowler, NE SE Sec. 13-7-17 ..... Rig.
C. Kennedy's No. 1 Travis, C SW NE Sec. 15-7-14 ..... Rig.
C. Canady's No. 1 Jones, NW cor. Sec. 14-8-14 .. .... Rig.

ROGER MILLS COUNTY

Ute Oil Co.'s No. 1 Williams, C SW Sec. 23-12-24w ..... Drlg. 5,150 ft.
L. C. Hivick's No. 1 Davis, C NW NE Sec. 4-11-26w .... Fishing 2,956 ft.; show oil.

SEMINOLE COUNTY

Sunray Oil Co.'s No. 1 Sunray, NW SE Sec. 35-5-5 ..... Location.

STEPHENS COUNTY

Ross Southerd's No. 1 McKinney, NE cor. Sec. 25-1-5w .. Shut down 1,062 ft.

WASHITA COUNTY

Cooper & Terhune's No. 1 Blocker, NW cor. Sec. 29-8-15w. Shut down 1,875 ft.
Burns & Prince's No. 1 Deck, SW cor. Sec. 21-8-18 .... Shut down 1,050 ft.

OKLAHOMA PANHANDLE
TEXAS COUNTY

Western Prod. Co.'s No. 1 Gable, C NE Sec. 24-4-13 .... Drlg. 2,250 ft.
Three Way Oil Co.'s No. 1 Crane, SW NW Sec. 11-1-18 .. Shut down 4,725 ft.

SOUTHERN OKLAHOMA
ATOKA COUNTY

R. P. Whelan et al's No. 1 Howard, NW SE NW Sec. 6-4s-11 ..... Abandoned 1,300 ft.
Brookshire's No. 1 R. W. Rowland, NW NE SE Sec. 18-2s-10 ..... Shut down 530 ft.

BRYAN COUNTY

Bryan County Oil's No. 1 Childs, NW SE SW Sec. 7-7-10.. T. D. 650 ft.
Bush et al's No. 1 Commerce Trust, NE cor. Sec. 35-6s-9 ..... T. D. 740 ft.; plugged back to 450-80 ft.

JEFFERSON COUNTY

Smith's No. 1 McCarty, SE NW NE Sec. 18-4s-8w ..... Location.
C. V. Chenault et al's No. 1 Grogan, SW NE SE Sec. 15-7s-6w ..... Drlg. 1,728 ft.

MARSHALL COUNTY

Taliaferro et al's No. 1 fee, NW SE SE NW Sec. 34-5s-5 ..... Drlg. 437 ft.
McCrory et al's No. 1 Little, NW SW Sec. 30-7s-6 ..... Bailing 10 bbls. of oil 495-97 ft.; recemented csg.; pumped 110 bbls. 20 hrs.
D. H. Curry's No. 1 Ward, NE SE SW Sec. 15-5s-6 .... Shut down 3,310 ft.

McCURTAIN COUNTY

The Oil Journal's No. 1 Parks, C NE NW Sec. 9-6s-23 .... Shut down 50 ft.
Stewart's No. 1 Patterson, C SE SE Sec. 7-6s-24 ..... Shut down 840 ft.

STEPHENS COUNTY

Brown's No. 1 Hightower, SW SE NE Sec. 15-3s-5w .... Drlg. 751 ft.

PUSHMATAHA COUNTY

George's No. 1 Lane, NW SE Sec. 32-3s-15 ..... Shut down 840 ft.

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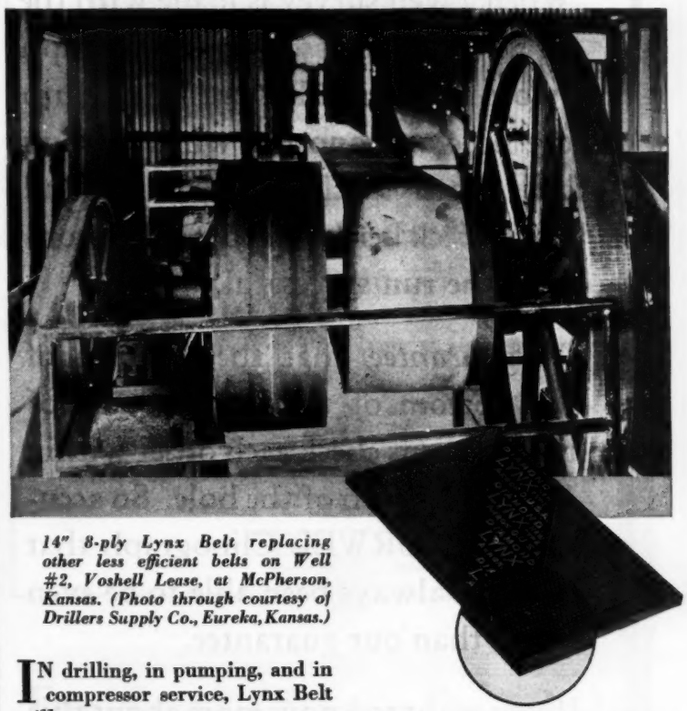

14" 8-ply Lynx Belt replacing other less efficient belts on Well #2, Voshell Lease, at McPherson, Kansas. (Photo through courtesy of Drillers Supply Co., Eureka, Kansas.)

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POWER TRANSMISSION EFFICIENCY OF OIL WELL PUMPING RIGS

By Charles L. Shirley*

Power transmission efficiency of the oil well pumping rigs is measured by the relative values of the power input and the power applied at the polished rod.

Pumping efficiency is measured by the relative values of the power applied at the polished rod and the calculated work performed in lifting the oil to a point of rest, usually at the stock tanks.

Over-all pumping efficiency expresses the relationships existing between the various components of the pumping equipments from the power input to the output of work done.

This paper will treat in a brief manner the mechanical efficiency of the surface equipment only. In general the action below the polished rod will not be discussed.

Covering a period of several years, various tests were made in order to check operating expenses and potential values of equipment. No concentrated and organized effort was made to check absolutely the power transmission efficiencies, but results were obtained which, when correlated with equipment and production records, indicate the results which would be obtained.

It must be remembered, in the business of oil production, that power transmission efficiency does not always mean economy from the profit statement vision point. But the gradual elimination of lost motion and increased operating efficiencies should reduce operating costs and increase profits.

In taking field observations a standard technique was developed and followed in taking any reading. Results were checked and often rechecked, instruments were calibrated at frequent intervals and all care taken to eliminate, so far as practical, any human or mechanical error.

Instruments Selected

The instruments, which were finally adopted, were selected because they combined to a very remarkable degree the following characteristics:

1. Portability.
2. Sturdy construction.
3. Simplicity and ease of operation.
4. Accuracy.
5. Ease of computing results.

Nearly all of the polished rod loads were taken with an open circuit hydraulic dynamometer using water as the fluid. This type of instrument, using water as the fluid and transmitting medium, gave results satisfactory under variable conditions. The indicator card area was computed by using an ordinary planimeter. A complete analysis was made by use of graphic geometry.

Power input for electrical rigs was measured by portable recording instruments. In checking general performance of the electrical equipment use was made of recording wattmeters, ammeters, voltmeters and power factory meters. This equipment was in turn checked by hand voltmeters and ammeters connected with a split core transformer.

At the time these tests were taken no satisfactory recording tachometer was available. All such instruments required more time and labor to install than was permitted. However, such instruments are necessary for the proper study of the time of power requirements.

Efficiencies, which are observed when machinery is tested on the manufacturers' test floors, are not found on the pumping well. The rapid fluctuation of stresses, from positive to negative peaks and reversals, are very different than constant loads of the test floors.

Series of Experiments

In considering efficiencies of belt-driven rigs a series of experiments was undertaken to determine the operating tensions of the pumping rigs. Apparatus was developed at that time by which the initial and operating belt tensions could be calculated. Additional experimentation checked the observation, "that maximum belt tensions could be calculated within allowable limits by measurement of the stresses at the polished rod." Since the calculations require the value of the component angular forces at the wrist pin and the force exerted at a point on the bandwheel periphery, stresses along the plane perpendicular to the axis of the prime mover take-off and parallel to the polished rod can be obtained. On the contrary stresses not in this plane, namely, stresses due to misalignment, shaft flexure, etc., are difficult to measure directly.

Several years ago, it was recommended that worm gear speed reduction units be installed at certain locations. The question arose as to the life of these gears; it was suggested that if they be run alternately in a reverse direction the gears would have twice the normal life. These gears had been designed to operate with reverse stresses, so a few power consumption tests were made while the machinery was running in a reverse direction. No increase in power was noted, but it was found out that less effective counterbalancing was required. Nothing further was done about reverse operations for several years until questions arose regarding power consumption. Other rigs were tested with varying results.

Vector analysis for a constant load indicates more normal loads, lower peaks and more equal distribution between compression and tension stresses are to be had when pumping in a reverse direction. Effective counterweighting and the harmonic time of the opposing stresses must be considered when reversing rig pumping motion. In many instances it was found that actual power input was reduced by reversing. But this was not true in every case.

It is usually impractical to reverse the standard belted gas engine. In order to gain increased power transmission efficiency, the jack posts have been set back from 6 to 14 inches. From vector analysis study it will be seen that a beam, having the three bearing points in line or equidistant from the level base line, will give stress efficiencies of nearly equal those of the set-back rig. These beams are very applicable when used in conjunction with a rotary type crank counterbalance.

Percentage of Efficiency

In checking motor-driven rig efficiencies it is frequently noted that some engineers deduct from the actual power input the percentage of efficiency given by manufacturers for partial loads and speeds. This method is certainly unjust as the prime mover of any type must be considered a portion of the rig unit, and true efficiency and economy are measured in units of operation cost.

With the advent of mobile, speedy and powerful pulling and hoisting units the useful application of the rig machinery is confined to pumping only. In this case the use of the high-speed, constant speed, reversible squirrel cage induction motor is desirable. The motors have a low initial cost and are easily installed. Motors of the size desired can be used and very high efficiencies obtained. Pumping speeds for these motors are varied by changing the reduction gear ratios. Checking a large number of this type of motors, of 1,200 r.p.m., the average motor efficiency was more than 85 per cent. Under somewhat similar conditions the typical two-speed, variable speed, oil well type motor used on the 600 r.p.m. winding gave an average motor efficiency of less than 45 per cent. The average rig efficiency of the two-speed, variable speed motor with belted countershaft and bandwheel was approximately 25 per cent, the range being between 20 and 30 per cent. The high speed, constant speed type gave an average rig efficiency of 45 per cent, the range being from 35 to 60 per cent.

On another series of tests other results were obtained. A two-speed, variable speed oil well type motor running on the low side obtained a maximum rig efficiency

*Before A.P.I. production division, Dallas, Tex.

of 69 per cent. The speed at this time was slightly more than 22 strokes per minute. The controller was hard over the ninth point. Efficiencies decreased in progressive order, until on the third point of control an overall rig efficiency of 28 per cent was observed. This rig was pumping from the third hole in the crank. It was a chain drive rig with double chain reduction.

Two similar rigs on which high torque, 600 r.p.m., squirrel cage motors were mounted gave overall rig efficiencies of 53 and 79 per cent. These rigs pumped from the second and fourth crank pin holes, respectively. The increased efficiency of the one rig is due to the heavier load handled. Both of these rigs pumped at the rate of 19 strokes per minute.

In the first case, using the electrical manufacturer's efficiency curves, the power transmission equipment alone gives an efficiency of 93 per cent. This result checks with the last mentioned 600 r.p.m. rig which also gives a power transmission equipment efficiency of 93 per cent. Checking this result with several other results indicate that such a pumping rig with a load of 10 horsepower or more and counterbalanced with rotary crank balance will have an efficiency approaching 95 per cent.

Checking countershaft and bandwheel rigs in the same manner, efficiency varies from 45 to 70 per cent. These rigs were of wood frame type, wood beams, babbitt bearings, grasshopper counterbalances and folded type belts. Given such advantages as concrete foundations, ideal type beam, antifriction bearing, flexible belts of high tensile strength, the standard belt driven rig may approach the high efficiencies previously mentioned.

Tests on gear units indicate variable efficiencies. Speed reducers of this character should be as carefully selected for oil field use as they are for industrial purposes. Well designed, properly balanced units have given results favorable when compared with standard rigs.

(Acknowledgement is made to E. T. Rohrhaste and John T. Hayward.)

DISTILLING TOPPED CRUDES FOR LUBS

(Continued from Page 22)

trifugal process is not adapted to the handling of stocks containing waxes having a high degree of crystallinity; that the bringing of stocks overhead has a tendency to cause subsequent crystallization of wax in larger and lighter particles, and in consequence it was thought that even in the case of the heavier stocks so produced the wax resulting from subsequent chilling would interfere with the continuous operation of the centrifugal dewaxing process.

There have, however, been improvements in vacuum distillation that have practically eliminated this objection. In the first place, the vacuum still has been brought to the point at which it is possible to cut so deeply into the crude that the heaviest wax and jelly-like fractions are vaporized, and, secondly, this may be done without sufficient cracking to destroy the amorphous nature of the precipitated wax.

Types of Vacuum Stills

It is desirable to produce overhead stocks suitable for centrifugal dewaxing not only in order that this manner of wax separation may be made available, but also for the reason that if the stock is so produced, it is certain that little, if any, cracking has taken place during the process of distillation, which is desirable not only with regard to the yield with relation to both the crude and the money invested in distillation apparatus, but also with respect to the characteristics of the finished product.

Producing overhead stocks by vacuum distillation which can be centrifugally dewaxed is not the simplest thing in the world. The success or failure of the entire procedure is controlled by the design of the vacuum still, and the manner in which it is operated.

To date most of the vacuum stills designed for this purpose have been of the single pass, single flash type, in which the topped crude is passed once through the coil and flashed to a fractionating column for subsequent fractionation. This operation is supplemented by the use of sufficient superheated steam fed at the base of the column to strip the residue and compensate for the temperature drop in the column due to vaporization. This type of still we believe to be adequate for the purpose provided: (1) That the column incorporates a sufficient number of trays of sufficient area, (2) that the temperature and volume of the superheated steam is sufficient to compensate for the temperature drop in the column. As a further advantage it is well to equip the tower with a side stripping section in which steam can be used for the close stripping of the stock which is to be subsequently dewaxed, as such a procedure not only insures the product coming to specifications, but, in addition, eliminates the floating or crystalline waxes which usually occur in the lighter cuts, and which if allowed to remain, if they do not interfere with the cold test of the finished product, at least tend to cause a troublesome aftercloud.

Experimental Data

Some time ago we erected a fair-sized experimental distillation unit with which we produced a large variety of centrifugally dewaxable stocks which differed somewhat from the single flash type. In this unit we utilized two heaters. Topped crude was passed through the primary heater and to the column, as in the case of the single flash system, except that the temperature utilized was kept somewhat lower so as not to crack the lighter fractions of the stock which we were after. As a result of the lower temperature, less oil was taken overhead by the heat supplied by the primary heater, but such part of it as was not vaporized was picked up at the bottom of the column, reboiled through the secondary heater, which was run at higher temperatures, and discharged into the top of a stripping column, to the bottom of which superheated steam was added. The vapors from the stripping column passed up through the fractionating column to assist in vaporizing the feed, and for supplying heat of vaporization.

Benefits From Reboiling

The reboiling idea commends itself for several reasons: In the first place, by reboiling better stripping of the bottom is obtained and it is thus possible to go further into the crude and secure the heavier fractions which are not as a rule produced with the single flash system. Furthermore, by having the still equipped with a reboiling section it is possible to utilize more reflux than would ordinarily be the case and thus clean up to a larger degree the vapors which are subsequently condensed in the stock that the refiner is after. In the third place, the reboiling system permits lower temperatures in the primary still by which the lighter ends of the dewaxable distillate are vaporized. It is these lighter ends which contain the waxes which are difficult to centrifuge. By utilizing a low temperature for the vaporization of these lighter ends there is less danger of subsequently forming waxes too crystalline for centrifuge operation. The heavier ends of the stock will stand higher temperature without interfering with subsequent centrifugal operation and this, of course, can be taken care of by the secondary heater.

As far as the ability of the centrifuge to handle these overhead stocks is concerned, the reboiling idea is most important from the point of view that it permits the refiner to go further into the crude. The waxes contained in these heavier fractions are more amorphous or, in other words, their crystals are smaller and represent what we call the real petroleum jelly. By virtue of bringing overhead these very heavy ends and the addition of these heavy amorphous waxes, it is possible to produce a much longer cut which can be centrifugally dewaxed than otherwise for the reason that the amorphous wax from the heavier stocks compensates for the crystalline wax in the lighter ends so that the conglomerate particles of wax formed by chilling can be more readily centrifuged. This can be

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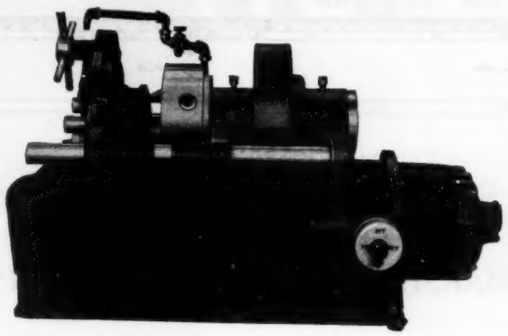

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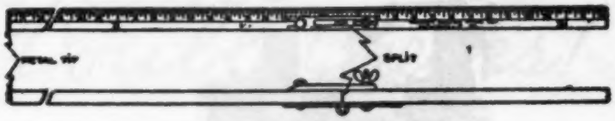

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best understood when it is pointed out that most of the plants utilizing vacuum stills for the production of overhead stocks have limited their centrifugal dewaxing units to the handling of overhead bright stocks.

In addition to that, most of them have blended this overhead stock on the basis of about 80 per cent overhead stock with 20 per cent of residual stock from which residual bright stock was formerly made. This procedure, it is claimed, is necessary so that the resulting product will have more body than is possible in the case of straight overhead. However, the blending of the residual stock adds petroleum jelly to the wax formation and does assist in dewaxing though I believe it is reported by most of those who are operating single flash stills that as far as dewaxing is concerned, the procedure is not necessary as far as the production of overhead bright stock is concerned.

Nevertheless, with our experimental still we have not only been able to produce overhead bright stock but have gone to long overheads with viscosities as low as 70 at 210° F. These stocks have been dewaxed to zero cold test, have been subsequently fractionated into neutrals and bright stocks, so that it would appear that if the vacuum still is properly designed, constructed and operated, it is entirely feasible to produce one's entire lubricating oil requirements by vacuum distillation, dewax the stock as a whole and after dewaxing fractionate it into various grades of lubricating oil according to market requirements. So far there are no commercial plants which have gone this far in this connection. However, if the experimental work which we have done is indicative of what can be expected from future commercial installations there seems to be no question but that the procedure will eventually round out into commercial form.

It would have many advantages, particularly in light of the requirement for zero cold test oils made from paraffin bearing crudes, for certainly it is much cheaper to dewax the whole lubricating value of the crude centrifugally than it is to make an overhead bright stock on one hand which is to be centrifugally dewaxed and then produce on the other hand a line of neutrals which can only result from low temperature wax pressing which at best from the point of view of plant investment requirements, operating cost and yield is not any too satisfactory.

There is one phase of dewaxing overhead distillates which is rather interesting. In the dewaxing of residual stocks it is necessary to bring the oil to color before undertaking the dewaxing operation. This has been due to the fact that it was impossible to precipitate the wax and subsequently separate it in the presence of the asphaltic bodies which are removed by decolorization.

In the case of overhead stocks quite the contrary is the case. It is not only possible but in many instances desirable to dewax the stock just as it is received from the distillation unit. After the dewaxing operation has been completed, the stock can then be either filtered or acid treated and filtered according to its nature, and brought to final color without loss in the cold test of the finished product.

It is a question, however, as to whether it is better to dewax these stocks prior to decolorization or after they have been brought to color. If they are dewaxed before decolorization, a considerable saving is effected for the reason that no money is spent in bringing the petrolatum content of the stock to color, which has no advantage for the reason that the petrolatum in most plants has only the value of pressure still charging stock. However, it can be pointed out that if the stock has not been decolorized before dewaxing, the dewaxing unit is called upon to handle a certain amount of material that eventually is discarded as a loss in the form of acid sludge as a result of subsequent treating operations. In as much, however, as the cost of centrifuging is less than the cost of bringing the oil to color and in as much as the loss to sludge in treating most overheads is, volumetrically, approximately the same as the

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petrolatum loss in dewaxing, it is rather felt that of the two procedures, the former has the advantage, particularly in as much as it permits the refiner to finish his stock with a filtering operation and there is no question but what a dark stock, if free from suspended asphalt, will centrifuge to a considerable advantage in comparison with a stock that has been brought to final color before centrifugal dewaxing.

CENTRAL WEST FIELDS

(Continued from Page 49)

Hopewell Township, Licking County. Barnhart and others made a location on the M. G. and C. O. Osborn farm, Section 2, Richfield Township, Summitt County.

McMillan and others are starting a test on the William M. Klooz farm, Lot 90, Columbia Township, Lorain County.

ILLINOIS

In Crawford County, L. C. McDowell and others' No. 11 on the J. F. Higgins No. 3 farm, Section 21, Montgomery Township, produced 4 bbls. initial. Price & Weger are drilling on the S. Stanfield farm, Section 36, Prairie Township, same county.

Coleman and others are drilling on the L. Liddle farm, Section 15, Wabash Township, Wabash County.

The Ohio Oil Co. drilled a dry hole on the C. H. Roe, Jr., farm, Section 24, Pinckneyville Township, Perry County. Bryan Lee Petroleum Co. is reported around 1,612 feet on the William Langewich farm, Section 4, Centralia Township, Marion County, and will give a deep test to the territory.

Duncan, Mack and others are drilling a deep test on the H. Woolridge farm, Section 23, Dorchester Township, Macoupin County, not far removed from the old developed field of shallow wells in the same county, where great activity was shown some 25 years ago.

KENTUCKY

In Barren County along the border of Hart County, two wells are reported gassers, one on the Emory and the other on the Case farm.

Hupp, Duff and others' No. 2 on the W. T. Spencer farm, in the Legrande Field of Hart County, is reported at 50 bbls. initial.

Hopkinsville Oil & Gas Co. is reported to have brought in a gas well on the Lucius Johnson farm, while in Carroll County the G. M. C. Oil & Gas Co.'s No. 1 Scottie Smith is a fair gas producer.

In Lee-Owsley Counties, C. G. Mays is reported to have brought in a 5-bbl. pumper in No. 7 Medley S. Cole farm, District 16. In Estill County, Petroleum Exploration Co.'s No. 11 Herman Miller farm, District 8, is reported showing for 10 bbls.

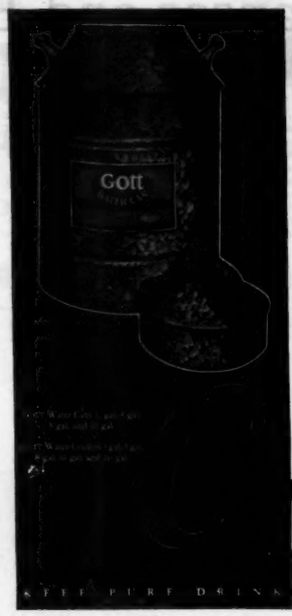
CONTEST CITY DRILLING

WASHINGTON, D. C., July 6.—The Supreme Court of the United States will decide whether the city of Los Angeles, Calif., may prohibit the drilling for oil on vacant property in the outskirts of that city by zoning such property as residential after preliminary expenditures amounting to $136,000 have been made by its owners to drill there. The Marblehead Land Co. and the Standard of California have petitioned the Supreme Court to review a decision of the Circuit Court of Appeals citing that the land zoned as residential is 7 miles from the center of the city—C. E. K.

CENTRIFUGAL PUMPS

Michael D. Aisenstein, chief engineer for the United Iron Works, Oakland, Calif., has just prepared a very complete treatise on centrifugal pumps, published as part of the Pacific Coast Gas Association's handbook.

Copies of this article may be had by writing the United Iron Works, and there should be a ready demand for it from engineers as it contains a very complete and concise synopsis of the characteristics of centrifugal pumps, with formulas and graphs showing application of this type of pump to many uses.



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Oklahoma-Kansas and Eastern Pipe Line Report

OKLAHOMA-KANSAS

Pipe Line Statement for April Runs

Company—	Month bbls.	Dly av. bbls.
Prairie P. L. Co.*	924,000	30,800
Gulf P. L. Co.	1,391,156	46,372
Texas P. L. Co.	641,879	21,396
Empire P. L. Co.	2,312,359	77,075
Magnolia P. L. Co.	1,598,556	53,285
Ceeden P. L. Co.	653,098	21,770
Stanolind P. L. Co.	3,340,000	111,333
Oklahoma P. L. Co.	2,159,471	71,982
Other lines*	6,960,000	232,000
Total April	19,980,617	666,020
Total March	19,803,139	638,810
Difference	177,488	27,210

Shipments

Prairie P. L. Co.†	2,324,661	77,489
Gulf P. L. Co.	1,497,417	49,914
Texas P. L. Co.	1,432,493	47,750
Empire P. L. Co.	2,292,164	76,405
Magnolia P. L. Co.	1,901,601	63,053
Ceeden P. L. Co.	773,783	25,792
Stanolind P. L. Co.†	3,641,874	121,379
Oklahoma P. L. Co.	3,124,819	76,827
Other lines	7,140,000	238,000
Total April	23,028,312	767,610
Total March	21,763,935	702,030
Difference	1,265,387	65,580

Stocks

Prairie O. & G. Co.*	37,225,000
Gulf P. L. and Gypsy Oil Co.	8,634,325
The Texas Company	3,553,996
Empire P. L. Co.	6,425,148
Mid-Continent Petroleum Co.	3,470,612
Stanolind Crude Oil Pur. Co.*	18,300,000
Magnolia Petroleum Co.	6,167,391
Oklahoma P. L. Co.	2,590,601
Carter Oil Co.	3,768,225
Other lines*	21,129,000
Total April	115,563,298
Total March	117,204,938
Difference	1,641,630

*Estimated. †Prairie and Stanolind shipments include Texas crude oil.

EASTERN PIPE LINE REPORT FOR MONTH OF MAY

Runs from Wells

In the following table will be found the regular receipts from wells by various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky, Illinois, Indiana and Michigan for April and May:

	Apr., 1931	May, 1931
Nat. Transit	142,938.57	143,585.75
S. W. Pa. P. L.	75,998.00	74,718.32
Eureka P. L.	294,234.07	293,679.22
Buckeye P. L. (Macksburg)	300,478.22	292,687.45
Buckeye P. L. (Cleveland)	11,192.35	13,408.60
Buckeye P. L. (Lima, etc.)	78,452.79	80,369.42
Indiana P. L.	2,975.41	3,425.44
Cumberland P. L.	166,133.49	158,976.48
N. Y. Transit	28,562.30	28,296.26
Tide Water P. L.	27,008.88	24,946.95
Pure Oil	195,221.33	185,974.65
Stoll Oil Ref.	.....	26,609.87
Bradford Transit	321,147.01	324,013.67
Total	1,647,436.50	1,653,692.08
Daily average	54,914.55	53,344.91

Petroleum Deliveries

The following tables exhibit the shipments or regular deliveries of various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky and Indiana for April and May:

	Apr., 1931	May, 1931
Nat. Transit	480,757.15	494,822.01
S. W. Pa. P. L.	386,704.31	442,582.39
Eureka P. L.	200,604.46	328,121.10
Buckeye P. L. (Macksburg)	230,921.29	231,067.12
Buckeye P. L. (Cleveland)	2,198.31	1,709.67
Buckeye P. L. (Lima, etc.)	1,677,678.11	1,588,532.48
Indiana P. L.	998,276.65	1,121,163.28
Cumberland P. L.	108,389.29	109,505.58
Southern P. L.	29,351.93	88,868.78
N. Y. Transit	174,908.27	191,931.04
Northern P. L.	165,693.77	177,918.97
Tide Water P. L.	451,375.06	454,064.43
Pure Oil	228,993.49	256,536.46
Bradford Transit	324,367.08	304,084.82
Tuscarora	283,195.69	285,769.63
East Gulf Oil	3,094.01	.....
Total	5,743,508.77	6,176,679.86
Daily average	191,450.29	199,247.74

Gross Stocks

The gross stocks held by various pipe lines in the oil producing sections of New York, Pennsylvania, West Virginia, Ohio, Indiana and Kentucky and Indiana at the close of April and May:

	Apr., 1931	May, 1931
Nat. Transit	790,741.10	753,134.11
S. W. Pa. P. L.	538,721.14	512,838.77
Eureka P. L.	1,762,107.52	1,817,026.88
Buckeye P. L. (Macksburg)	513,877.24	370,904.34
Buckeye P. L. (Cleveland)	46,073.83	58,962.66
Buckeye P. L. Lima, etc.)	3,730,603.33	3,641,367.87
Indiana P. L.	603,583.09	518,335.78
Cumberland P. L.	659,658.19	644,027.51
Southern P. L.	312,817.70	317,548.61
N. Y. Transit	109,007.83	126,136.54
Northern P. L.	291,059.44	339,978.15
Tide Water P. L.	900,197.73	863,211.61
Pure Oil	604,079.70	541,284.20
Tuscarora	13,173.80	13,462.07
Bradford Transit	164,714.48	210,020.88
East Gulf Oil	4,071.47	.....
Total	11,044,487.59	10,728,239.98
Increase	32,325.03	
Decrease		316,247.61

Grades of Oil

The following table shows the amount of the different grades of oil held by the Eastern Pipe Lines at the close of April and May, showing gross stocks of the above fields:

	Apr., 1931	May, 1931
Pennsylvania	3,966,991.51	3,895,594.08
Lima	809,789.61	792,443.56
Kentucky	674,030.47	654,328.32
Mid-Continent	4,984,054.76	4,854,341.47
Illinois	16,978.58	.....
Michigan	592,642.76	531,532.55
Total	11,044,487.59	10,728,239.98

Daily Average Runs

The following table shows the daily average runs of the Pennsylvania, Lima and Kentucky oil fields for the past four years:

	1928	1929	1930	1931
January	52,904	51,749	75,907	53,939
February	57,002	51,833	79,256	55,163
March	57,485	54,252	76,688	54,331
April	56,812	58,444	84,536	54,914
May	62,067	59,902	70,546	53,344
June	58,330	58,833	75,430	.....
July	57,144	66,087	68,921	.....
August	57,745	66,087	54,291	.....
September	53,487	67,315	56,595	.....
October	58,100	76,093	58,179	.....
November	53,865	74,831	52,332	.....
December	52,025	74,561	53,999	.....

Daily Average Shipments

The following table gives daily average shipments from the Pennsylvania, Lima and other fields for the past four years:

	1928	1929	1930	1931
January	146,465	165,721	217,622	175,369
February	167,368	159,387	224,355	183,494
March	158,882	161,474	228,846	189,508
April	172,935	169,737	241,845	191,450
May	180,559	184,281	248,383	199,247
June	188,024	185,404	234,401	.....
July	189,470	194,763	207,094	.....
August	192,853	194,946	205,506	.....
September	194,138	201,314	193,999	.....
October	176,000	191,367	157,675	.....
November	176,898	202,743	146,638	.....
December	173,572	186,257	143,001	.....

Gross Stocks

In the following table will be found the gross stocks of the various lines of the Pennsylvania, Lima and Kentucky oil fields, including oil received from other lines at the close of each month for the past three years:

	1929	1930	1931
January	7,596,564	12,320,045	11,831,092
February	8,738,835	12,991,561	11,506,489
March	9,002,058	13,247,317	11,012,162
April	8,978,173	13,233,961	11,044,487
May	8,903,560	13,052,953	10,728,239
June	8,921,275	13,296,855	.....
July	9,211,595	13,268,562	.....
August	9,440,643	13,047,051	.....
September	9,443,067	12,812,018	.....
October	9,441,101	12,437,555	.....
November	9,368,538	11,851,380	.....
December	11,253,953	11,761,952	.....

The Illinois Field

The following table gives the report of the Illinois Pipe Line Co. in Illinois:

Gross stocks, June 1	643,438.62
Runs from wells	408,284.85
Other receipts	32,190.36
Regular deliveries	297,567.00
Other deliveries	208,208.37

The amount of Illinois oil run by the Tide Water Pipe Co. in May was 24,946.95 bbls. Deliveries were 24,946.95 bbls. Adding these figures to those of the Illinois Pipe Line Co. makes the runs and deliveries as follows:

1931	Runs	Deliveries
May	433,231.80	322,513.95
1930—		
January	543,387.95	498,293.93
February	548,416.33	414,536.59
March	631,944.49	469,119.53
April	530,074.23	509,304.68
May	605,147.37	504,069.84
June	572,662.57	468,658.81
July	604,529.54	388,454.47
August	594,642.12	375,742.43
September	457,001.11	371,691.63
October	478,442.12	320,688.73
November	422,794.68	355,403.13
December	656,418.78	363,719.65
1931—		
January	468,429.04	669,573.19
February	429,284.54	461,262.85
March	434,638.33	356,663.24
April	421,514.98	282,531.65

Tide Water Pipe Co., Ltd., also delivered in May, 163,543.95 bbls. Oklahoma oil.

AVERAGE DAILY RECEIPTS OF CALIFORNIA CRUDE AND REFINED OIL AT ATLANTIC AND GULF PORTS

Average barrels per day in 1930-31—	Atlantic Ports: Baltimore	Boston	New York	Philadelphia	Others	Total	Gulf Coast Ports: Galveston	New Orleans, Baton Rouge	Port Arthur, Sabine Pass	Tampa	Total	Total all ports
June	8,300	.....	32,933	20,767	2,333	65,333	.....	.....	.....	.....	2,400	67,733
July	17,355	7,774	43,419	23,539	6,452	98,839	.....	.....	.....	.....	4,645	103,484
August	7,418	8,743	38,968	21,226	5,258	81,613	.....	.....	.....	.....	97	81,710
September	6,300	6,400	25,500	13,400	9,567	61,267	.....	.....	.....	.....	2,433	63,700
October	2,516	3,065	27,258	16,419	4,903	54,161	.....	.....	.....	.....	5,355	59,516
November	8,367	6,333	33,800	17,733	4,500	70,733	.....	.....	.....	.....	4,800	75,533
December	5,516	4,322	30,645	9,674	8,580	58,742	.....	.....	.....	.....	4,645	58,387
January	8,387	6,613	21,968	14,473	11,096	62,742	.....	.....	.....	.....	6,129	68,871
February	5,787	2,713	29,143	4,000	5,750	47,393	.....	.....	.....	.....	3,750	51,143
March	10,032	1,611	21,288	7,324	8,774	49,129	.....	.....	.....	.....	6,355	55,484
April	5,133	.....	19,200	16,500	10,067	50,900	.....	.....	.....	.....	4,000	54,900
May	4,452	3,064	19,903	11,226	6,258	44,903	.....	.....	.....	.....	2,355	47,258

AVERAGE DAILY IMPORTS OF CRUDE AND REFINED OIL AT PRINCIPAL UNITED STATES PORTS

Average barrels per day in 1930-31—	Atlantic Ports: Baltimore	Boston	New York	Philadelphia	Others	Total	Gulf Coast Ports: Galveston	New Orleans, Baton Rouge	Port Arthur, Sabine Pass	Tampa	Total	Total all ports
June	51,533	15,667	121,067	45,033	25,033	258,333	4,413	17,367	2,167	1,333	25,300	283,633
July	42,097	9,548	154,968	37,935	36,032	280,580	5,678	9,161	2,097	2,387	19,323	299,903
August	39,032	4,484	145,613	33,355	25,097	247,581	8,419	9,323	8,548	3,000	29,290	276,871
September	38,867	8,533	150,933	34,500	25,567	258,400	6,433	12,234	.....	3,800	22,467	280,867
October	19,839	11,742	146,194	35,355	26,967	240,097	6,065	7,067	2,774	2,545	18,451	258,548
November	39,633	35,900	124,633	36,467	24,667	261,300	2,467	7,366	.....	1,767	11,600	272,900
December	31,419	14,033	122,774	32,839	33,774	224,839	6,290	10,618	2,097	290	19,290	244,129
January	17,613	13,519	154,225	32,902	30,612	248,871	2,032	11,677	2,097	3,097	18,903	267,774
February	31,321	16,929	127,786	31,714	26,857	234,607	4,536	11,571	.....	536	16,643	251,250
March	27,645	13,935	141,160	26,290	21,129	238,161	4,065	2,580	.....	1,968	8,613	246,774
April	35,000	10,533	105,000	29,767	35,533	215,833	2,733	3,400	.....	.....	6,133	221,966
May	30,129	8,774	107,000	25,452	26,710	198,065	.....	2,000	.....	.....	2,000	200,065

GROSS PRODUCTION OF CRUDE OIL IN THE UNITED STATES FOR 12 MONTHS

(In Barrels of 42 Gallons)

1930—		California	Oklahoma	Texas	Kansas	Arkansas	Louisiana	Rocky Mts.	Eastern	Total
May:	Month	19,044,444	20,587,503	26,219,488	3,978,385	1,659,895	1,907,452	2,565,219	4,414,000	80,376,776
	Daily average	614,337	664,113	845,786	128,335	53,545	61,543	82,749	142,387	2,592,799
June:	Month	18,020,795	19,754,700	25,643,705	3,765,060	1,704,060	1,925,621	2,519,190	4,288,000	77,621,131
	Daily average	600,693	658,490	854,790	125,502	56,802	64,187	83,973	142,933	2,587,371
July:	Month	18,802,024	19,032,514	25,973,521	3,541,409	1,713,680	2,079,769	3,275,894	3,830,000	77,248,811
	Daily average	606,517	581,694	837,856	114,239	55,280	67,089	105,674	123,548	2,491,897
August:	Month	18,770,466	17,162,034	25,069,598	3,491,530	1,760,102	2,151,120	3,193,341	3,417,000	74,955,191
	Daily average	605,499	553,614	808,696	112,630	56,842	69,391	103,011	110,226	2,417,909
September:	Month	17,984,306	16,509,120	23,111,822	3,405,510	1,583,280	2,008,060	3,239,010	3,396,000	71,237,108
	Daily average	599,477	550,304	770,394	113,517	52,776	66,935	107,967	113,200	2,374,570
October:	Month	18,244,053	16,632,523	23,626,553	3,571,913	1,636,552	2,142,585	3,225,550	3,627,000	72,707,029
	Daily average	588,518	536,533	762,147	115,223	52,792	69,125	104,050	117,000	2,345,388
November:	Month	18,109,459	14,941,770	22,035,222	3,459,330	1,557,870	2,136,948	2,957,100	3,322,000	68,419,699
	Daily average	603,648	498,059	734,507	115,311	51,929	71,231	98,570	107,400	2,280,656
December:	Month	17,786,728	15,057,103	21,810,359	3,432,661	1,590,951	2,157,534	3,118,663	3,328,000	68,281,999
	Daily average	573,765	485,713	703,560	110,731	51,321	69,598	100,602	107,355	2,202,645
1931—										
January:	Month	16,485,798	14,850,953	20,690,452	3,149,073	1,574,955	2,131,937	2,966,142	3,374,000	65,223,310
	Daily average	531,793	479,063	667,435	101,583	50,805	68,772	95,682	108,839	2,103,978
February:	Month	14,830,932	13,371,876	18,964,596	3,369,016	1,402,492	1,981,476	2,747,024	3,129,000	59,896,413
	Daily average	533,248	477,567	677,307	120,322	50,089	70,767	98,108	111,750	2,139,158
March:	Month	16,364,842	16,430,341	22,975,309	3,498,593	1,444,941	2,033,197	2,897,725	3,374,000	69,019,263
	Daily average	527,898	530,011	741,139	112,858	46,611	65,587	93,475	108,839	2,226,428
April:	Month	15,803,541	16,717,650	26,611,890	3,281,880	1,412,220	1,920,780	2,883,100	3,273,000	71,909,061
	Daily average	526,785	557,255	887,063	109,396	47,074	64,026	96,270	109,100	2,369,969
Total 12 months		210,347,338	200,048,087	282,732,515	41,944,365	18,980,998	24,577,169	35,592,958	43,673,000	856,895,430